

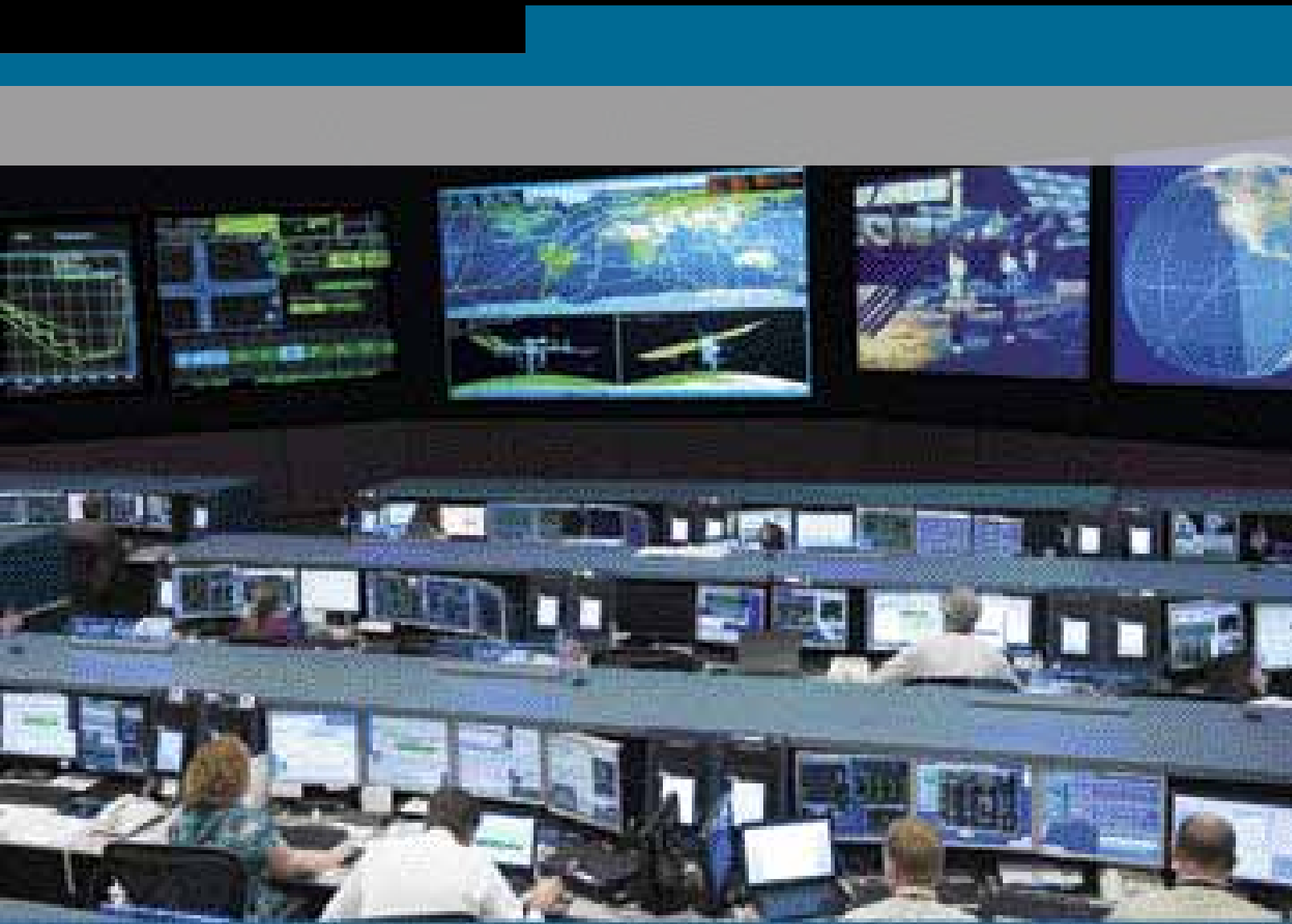
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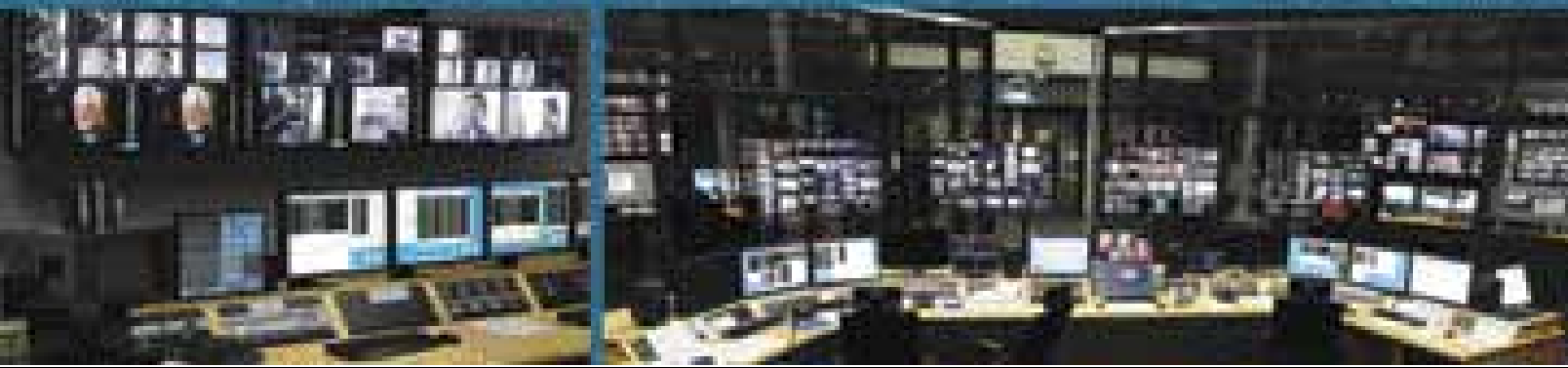
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The High-Performance KVM, HD Video, Peripheral Matrix Switching and Extension Sourcing Guide

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The High-Performance KVM, HD Video, Peripheral Matrix Switching and Extension Sourcing Guide



The High-Performance KVM, HD Video, and Peripheral Matrix Switching and Extension Design and Sourcing Guide

This guide presents education resources and the technology solutions you need to set up high-performance KVM and extension and switching applications. We have simplified the job of having to configure KVM, extension, and peripheral matrix switching systems, making it easier for you to plan and launch fully integrated extension and switching systems for your specific industry.

In the Technology Overview section, we talk about some of the emerging technologies to be aware of as you design your system. Throughout the following catalog of products, we illustrate applications and case studies for you to use as guides for your own plans.

As always, we are here 24/7 to answer your questions. If you don't see what you need, just give us a call!



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High-Performance

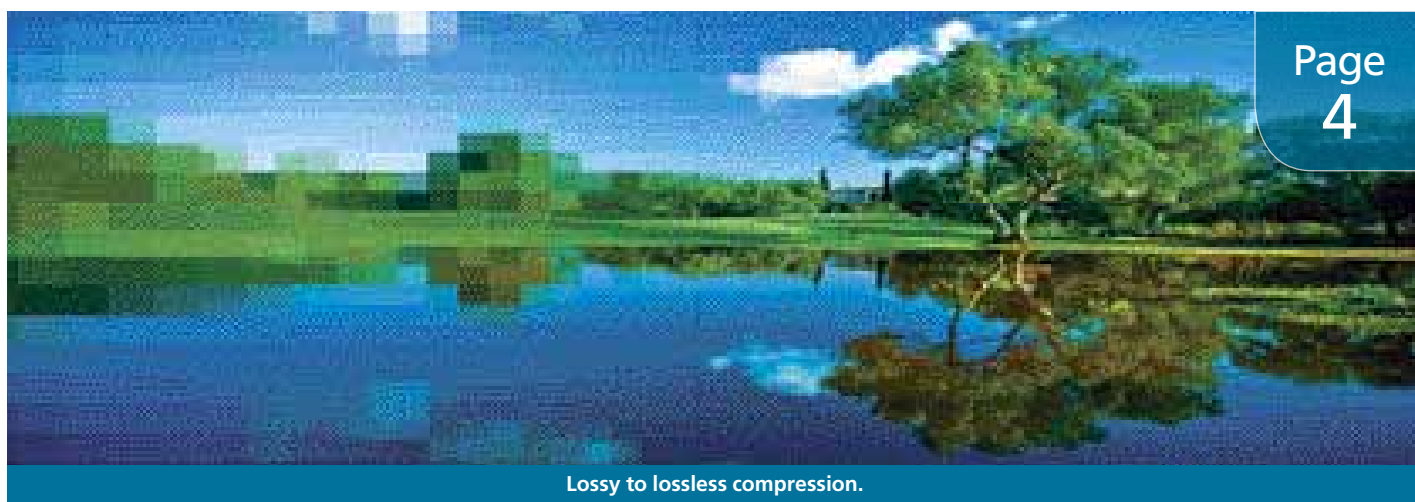
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- Museum Digital Signage
- Graphic Design Production



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Lossy to lossless compression.

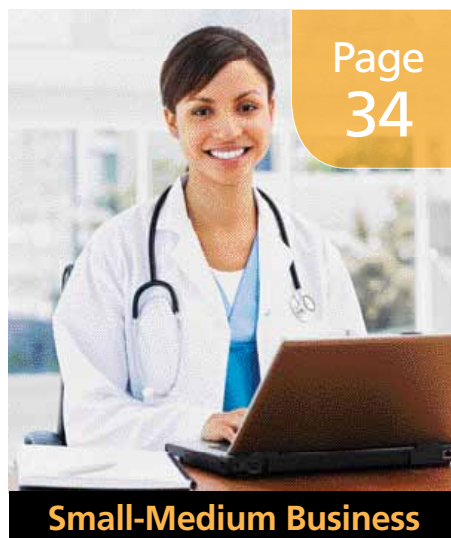
Going the Distance: The Future of Video Extension

Analog video is being phased out in favor of high quality, high-definition video.

Find out what you need to know to make the change.



- Industrial
- Broadcast
- Campus Buildings



- Physician Offices
- Banking
- Expanding Start-Ups

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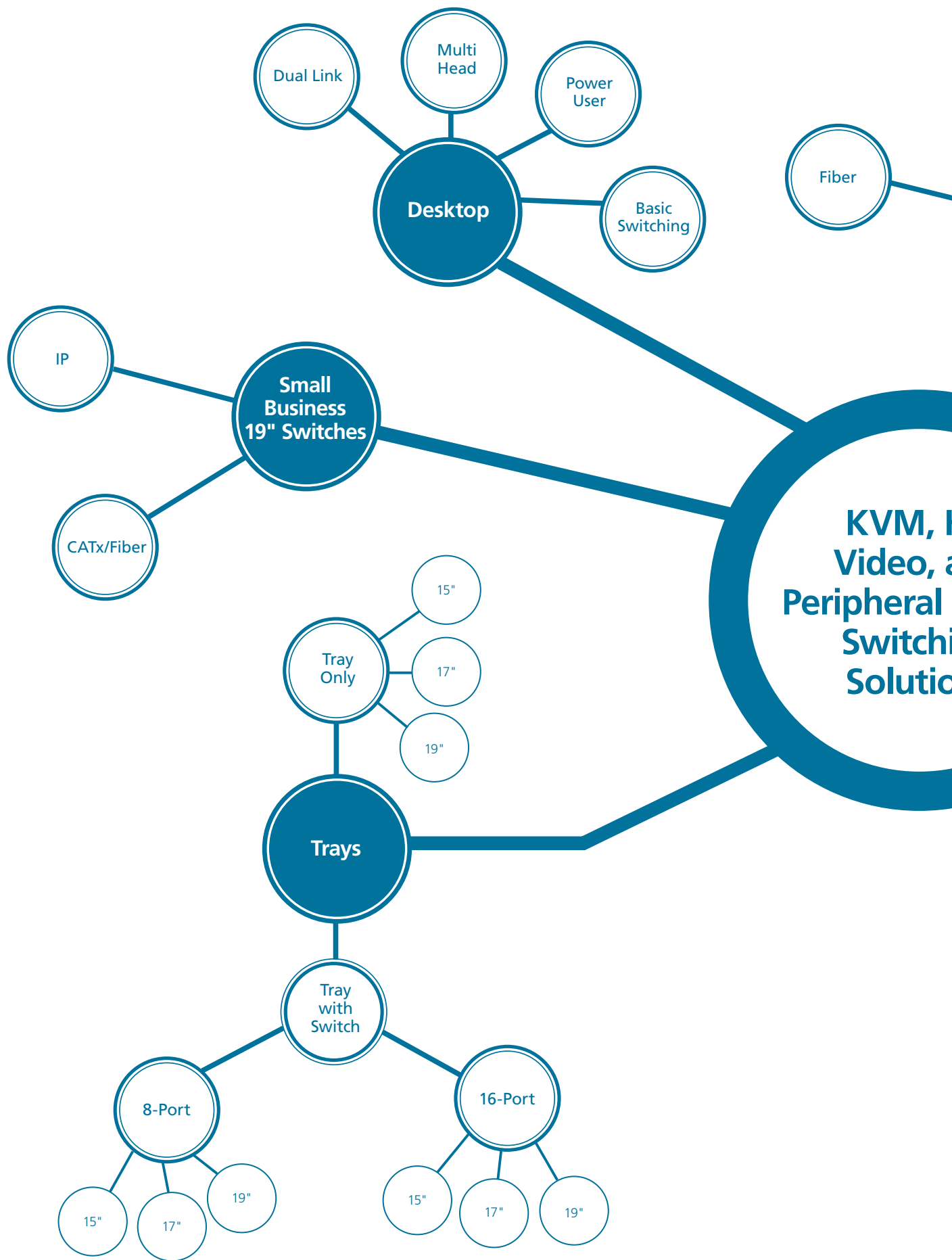
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HD and Matrix Switching Solutions

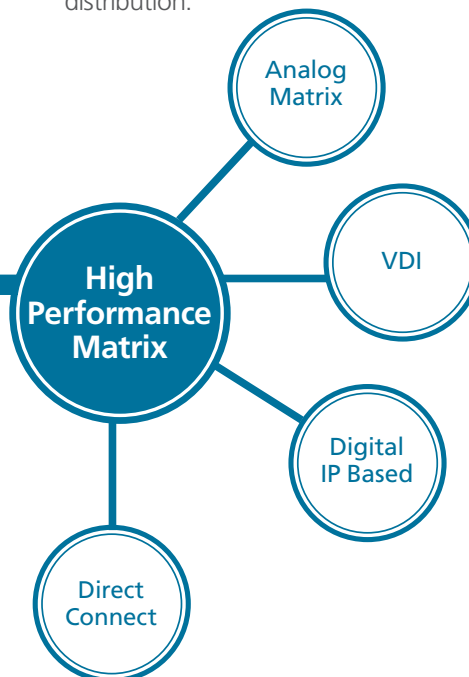
KVM, HD Video, and Matrix Switching

Control, Convenience, and Total Cost Savings

KVM—which stands for Keyboard, Video, Mouse—HD Video, and Peripheral Matrix Switching give users access to a variety of target devices (CPUs, digital signage, servers, and so on), the ability to monitor workflow, and flexible control of visual and peripheral elements. Switching and extension provide effective management of technology elements in broadcasting, air traffic control, control rooms, and other collaborative environments.

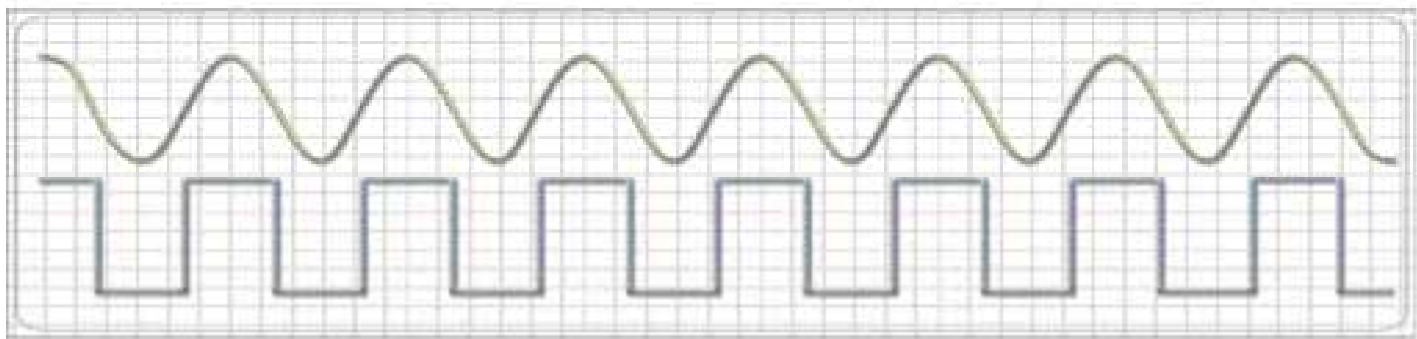
Additionally, KVM technology gives users:

- A small total cost of ownership (TCO). Switching and extension solutions from Black Box have an average lifespan of seven to ten years. Generally they survive two generations of target devices.
- Improved operability and a quick return on investment (ROI) due to better workplace ergonomics and productivity.
- Maximum flexibility, scalability, and improved reliability for 24/7/365 back-up scenarios and fast fall-back solutions.
- Green IT solutions with energy-saving design and distribution.



Going the Distance: The Future of Video Extension

By Erik Indresovde



Analog versus Digital Video

Analog video (VGA)

An analog signal is continuously variable. Composite video, Component video, RGBHV, and VGA are types of analog video signals, with VGA being the most common video format used with PCs—at least until recently.

An analog video signal can be run over long lengths of native VGA cable as long as the diameter and shielding of the cable is good enough. However, regardless of the cable quality, signal attenuation increases with video frequency and cable length. This means that after 9 to 15 meters, the image quality will start to degrade. This leads to color skew and smeared-looking text.

To solve for signal degradation in VGA applications, use an extender that compensates for signal loss. A good extender has separate adjustments for high and low frequencies; HF loss is usually greater than LF loss.

Digital video

While analog video signals travel in a sine-like wave form, digital signals travel in a square-like waveform. A digital signal is broken into a binary format where the audio or video data is represented by a series of 1s and 0s. Like analog signals, digital video also suffers from loss, but as long as the cable is of sufficient quality and within the maximum supported distance, the signals don't suffer from blurring or color skew. HDMI and DVI (explained below) are examples of typical digital video interfaces.

However, what you will get when the maximum supported cable length is exceeded is the “cliff” effect, where the digital signal drops off and you completely lose the picture. To overcome distance limitations, you need to use extenders or repeaters.

DVI and HDMI Interfaces

Digital video interface (DVI)

DVI is the standard digital interface for PCs.

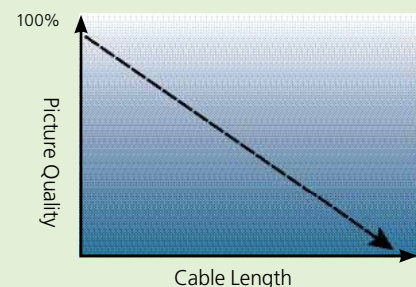
The DVI standard is based on transition-minimized differential signaling (TMDS). DVI comes in two formats: single-link and dual-link. Single-link DVI has a maximum frequency of 165 MHz, and dual-link DVI, as you would expect, has double the maximum frequency. A single-link interface can transmit a resolution of 1920 x 1200 vs. 2560 x 1600 for dual link.

The most common DVI connectors are:

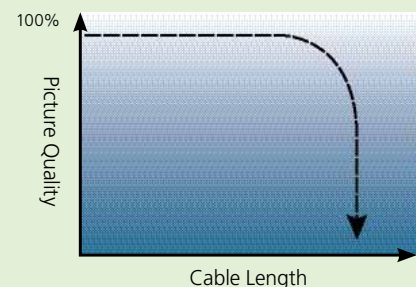
- **DVI-D:** A digital-only connector for use between a digital video source and monitors. DVI-D eliminates the analog pins.
- **DVI-I (integrated):** Supports both digital and analog RGB connections. It can transmit either a digital-to-digital signal or an analog-to-analog signal. It is used on products instead of separate analog and digital connectors.

High-definition multimedia interface (HDMI)

HDMI® is the standard digital interface for HDTV. It was the first digital interface to combine uncompressed HD video, up to eight channels of uncompressed digital audio, and intelligent format and command data in a single cable. It is now the de facto standard for consumer electronics and HD video, although it is beginning to face competition from the newer DisplayPort (DP) interface. In addition, HDMI also uses TMDS signaling, like DVI, and is backward compatible.



Picture quality of an analog signal gradually declines over longer lengths of cable.



Picture quality of digital signal (e.g. HDMI) suddenly drops at a certain length of cable (cliff effect).



DVI-D Receptacle Connector



DVI-I Receptacle Connector



HDMI Connector

HDMI offers an easy, standardized way to set up AV equipment over one cable. Use it to connect equipment such as digital signage players, set-top boxes, and AV receivers with HD TVs and video projectors. If the HDMI equipment supports higher-resolution HDMI standards, you can also connect 3D displays.

HDMI also supports multiple audio formats from standard stereo to multichannel surround sound. In addition, the interface provides two-way communications between the video source and HDTV, enabling simple, remote, point-and-click configurations.

It also supports high-bandwidth digital content protection (HDCP), which prevents distribution and copying of digital audio and video content sent over HDMI cable. If you have a device between the source and the display that supports HDMI but not HDCP, your transmission won't work if the content is copyright protected.

HDMI is backward compatible with DVI equipment because, like DVI, it uses TMDS signaling. A DVI-to-HDMI adapter can be used without a loss of video quality to enable the connection. Because DVI only supports video signals, not audio, the DVI device simply ignores the extra audio data. However, dual link is not common in HDMI. DVI displays usually also are not able to display HDCP protected and/or component encoded (YCbCr) HDMI signals.



Technical Aspects of Digital Video Extension

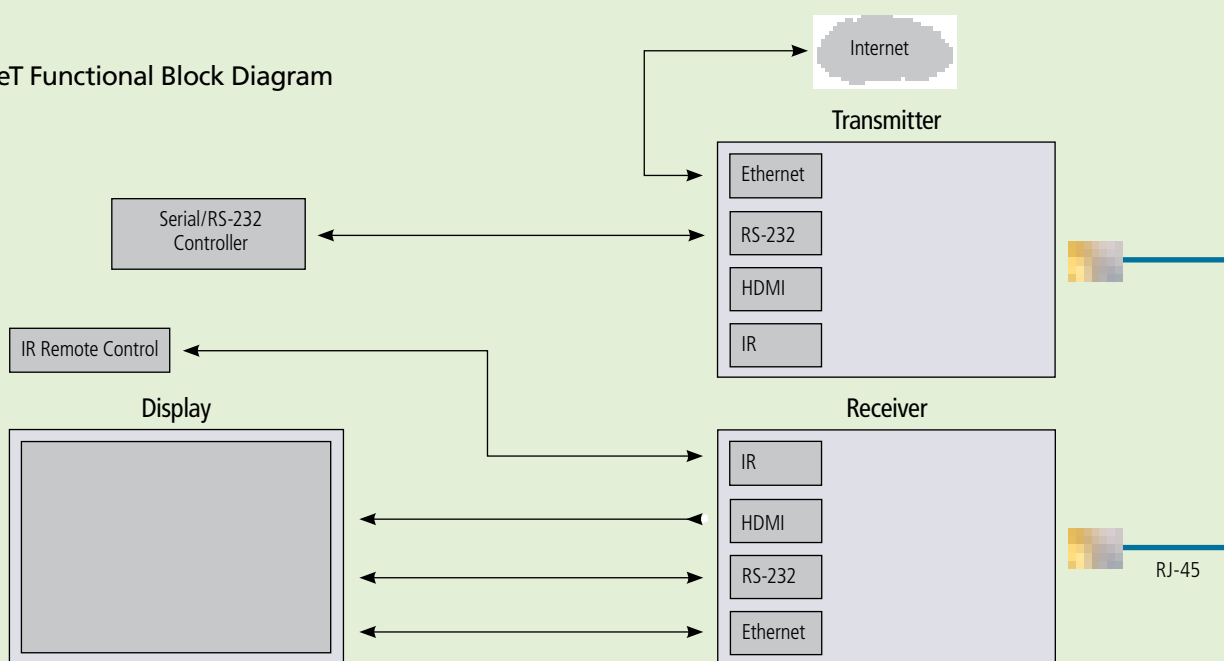
Lossless proprietary extension

When the TMDS signal collapses because of attenuation, or too long a cable, it is no longer readable by a display. However, an extender or repeater uses a proprietary digital algorithm to transmit and receive signals over a specific distance, and can equalize and reshape the TMDS signal for the end display. Proprietary extension technology enables users to extend HDMI or DVI to a remote display up to 30-35 meters away without any loss or signal degradation. Extension is possible over native HDMI or DVI cabling with a repeater device equalizing the signal, or over CATx with an extender setup that consists of transmitter and receiver devices.

HDBaseT extension

HDBaseT™ is the first technology to enable long-reach wired connectivity of uncompressed HD multimedia content via a single LAN cable. HDBaseT enables transmission of DVI or HDMI video and audio, 100BASE-T Ethernet, power, and control signals from a source to a display over a standard CATx cable. By using sophisticated encoding and equalization techniques, it is possible to transmit the video signal as well as the peripheral signals uncompressed up to 100 meters. The chip has proven to be very reliable and is the only solution on the market today allowing transmission of uncompressed video on standard CATx cables at that distance.

HDBaseT Functional Block Diagram



Going the Distance (continued from previous page)

Compressed digital extension and IP extension

Another technique to extend video over longer distances using reduced bandwidth is to use compression. Compression makes it possible to run the signal over longer-distance cable, to transmit it wirelessly; or to send it over a standard IP network, the local area network (LAN).

Compression does not have to mean low-quality video. Compressions may be lossy or lossless. The compressions used on cable TV or Internet video streams are usually lossy compressions, such as H.264. Although these compressions give sufficient image quality for digital signals, they are not suitable for high-quality computer images in control rooms or medical applications.

These applications require higher bandwidth but usually run over a LAN where bandwidth is not an issue, not over the Internet. The best compression algorithms today make it possible to run Full HD computer images and video over the local network without any visual loss in quality.

IP extension is a way to extend your application over long distances. IP extension is flexible and expandable, and gives you the option of using either CATx or fiber optic cabling, depending how far you want to go. IP-based extenders usually send data over a 100-meters segment, but you can extend farther by using Ethernet switches as repeaters; or, if using fiber cable, go even farther, up to at least 16 kilometers.

Fiber optic extension

For the really long runs exceeding 120 meters, the best option is fiber optic extension, unless you can use multiple repeaters or run the signal over an IP network. The biggest advantage with optical extension is the very high bandwidth compared to copper cable.

This makes it possible to transmit lossless, full HD signals over great distances—up to thousands of meters. Furthermore, using a fiber cable makes the connection optically isolated, getting rid of any issues with ground loops, etc. This is usually required in hospitals and other critical applications. An optical connection is also immune to EMI noise, making it the perfect choice for industrial applications.



Lossy to lossless compression.

A Brief Overview of Video and Peripheral Extension

One of the most common types of video and peripheral extension is keyboard, video, and mouse (KVM) technology extension.

These types extenders connect users via human interface devices (HIDs), like keyboards, touchscreens, and monitors, to target devices—servers, workstations, computers—without the need for drivers to be installed on the target devices. Although these solutions primarily extend or switch HD video and KVM

signals, most extenders also support audio, RS-232, and USB signals. The goal of video and peripheral extension technology is to share resources and improve operability transparently.

In general, good extension solutions have a low total cost of ownership (TCO) because they last seven to ten years. This means they survive at least two generations of targets and peripheral devices, which usually are updated much more quickly. Good video and peripheral extension devices shouldn't need to be replaced

that soon. They should demonstrate future compatibility through connections, cascability, and scalability. Video and peripheral extension solutions should also offer a quick return on investment (ROI). By improving operability, ergonomics, and work time savings, this type of extension leads to a more efficient use of human resources. In addition, video and peripheral extension is a green IT solution, leading to energy and cost savings.

A Brief Overview of USB Peripheral Extension

USB Essentials

USB's main attraction is that it makes adding peripherals to your computer incredibly easy. It enables you to connect peripherals to the outside of the computer so you don't have to open your PC. A USB peripheral plugs right into the port and works. You don't even need to reboot your computer.

Virtually every operating system (OS) on the market today is USB enabled. USB technologies come in a variety of versions and speeds. Logos were created for each of the product specifications, from standard USB 1.1 to SuperSpeed USB 3.0, the latest technology. The most common version in use today is USB 2.0.

USB Extension

Although USB is a versatile serial interface, it's subject to an inherent distance limitation of five meters. USB extenders enable USB peripherals to be placed wherever users need them, up to 2 kilometers from a host computer. With a USB extender, peripheral

devices function as if they were within the five-meter limit specified by USB Implementers' Forum (USB-IF), which prepares the specifications for USB technology.

USB extenders preserve standard USB functionality and timing restrictions while accommodating the increased cable delay incurred in extended-range transmissions.

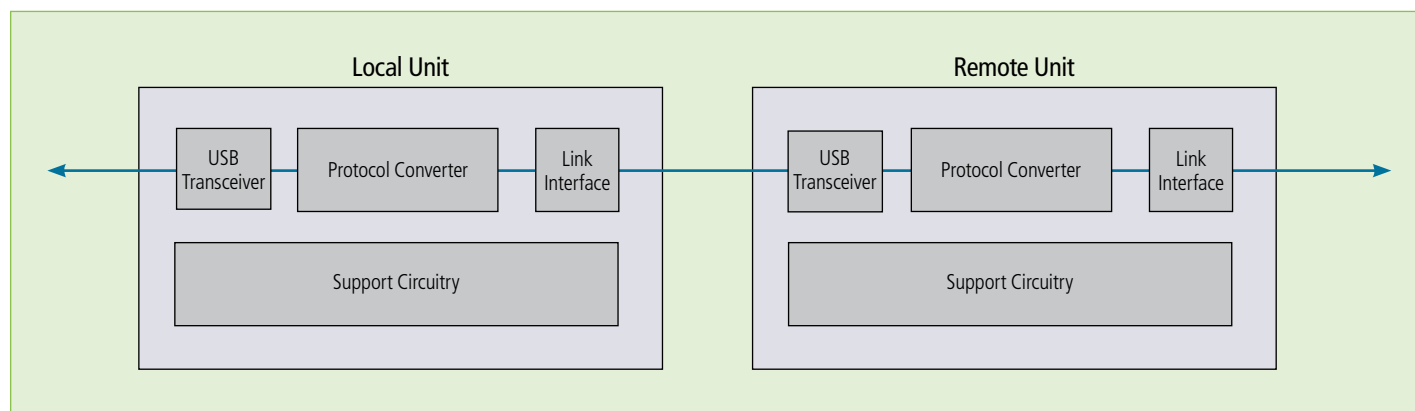
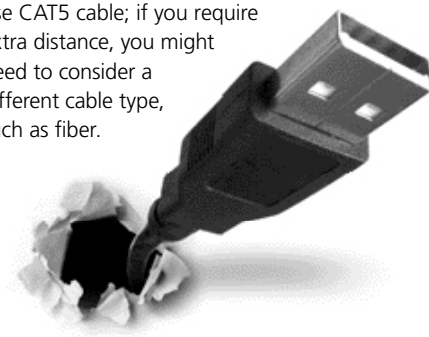
USB extenders are composed of two units connected by a transmission line. These units are referred to as the local extender and remote extender. The local unit is connected to a downstream-facing port of a USB host controller or hub; the remote unit is connected to the upstream-facing port of a USB hub or device. Once operational, the entire USB extender system operates like a single standard USB hub.

As a standard USB hub, the USB extender system is compatible with all operating systems that support USB hubs and requires no additional software to be loaded.

Because the system appears to be as a

conventional hub (albeit a very long one), it can be connected to other hubs to the full depth permitted by USB. The system can be used as the first, last, or any intermediate hub in a chain. Multiple systems can also be used in parallel within a single domain—a common situation when opposite ends of a building need to be reached from a central computer room or telecom closet.

The only restriction placed on the configuration is that multiple USB extenders cannot be connected in series. Most USB extenders use CAT5 cable; if you require extra distance, you might need to consider a different cable type, such as fiber.



The Development of True USB Emulation for Better Switching

By Black Box Engineering

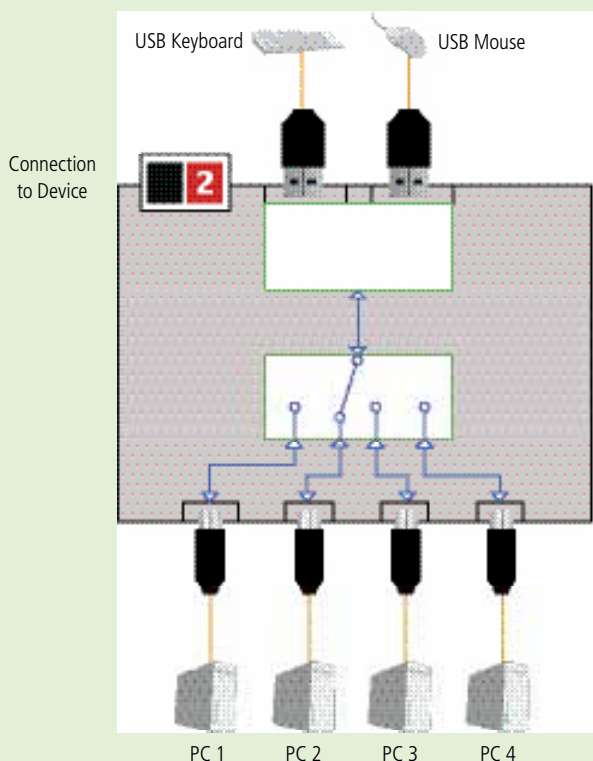
The earliest USB KVM switches relied upon standard keyboard and mouse templates to tell each computer system how to deal with the connected peripherals. High-performance KVM switches and HD video and peripheral matrix switches that support true USB emulation technology channel the identities of the connected keyboard and mouse and present those "real" profiles to every connected system concurrently. This means even specialized keyboards and mice (i.e. USB Sun keyboards, Glidepoint® mice, jog wheels, and more) are fully supported.

Enumerated USB

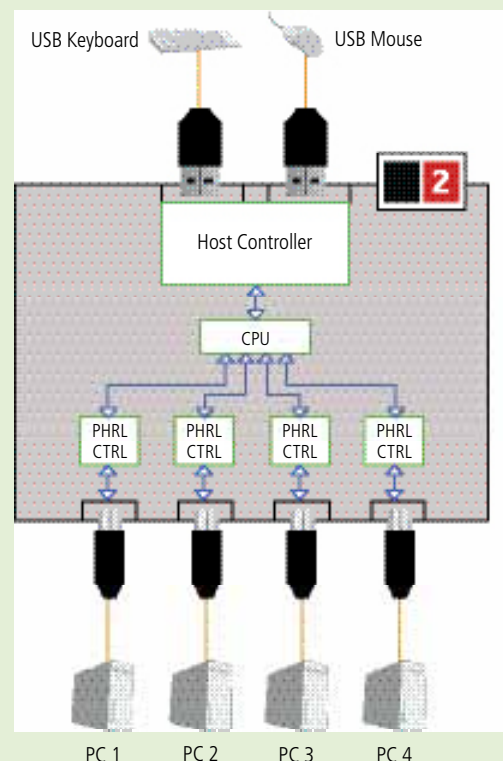
In the beginning, when USB connectors first were becoming common, there was simply enumerated USB. The name is derived from the initiation process (enumeration) that every USB device goes through each time it is connected to a computer. With enumerated switches, a connected USB device is required to perform a full initiation every time it is switched. This leads to latency issues, especially with mice and keyboards.

Emulated USB

Due to the complexity of the USB signals and standards, a straightforward way to read inputs of USB data streams, strip out the switching control information, and then repackage the remainder for the computer had been difficult to achieve. Eventually, emulated USB solved the problem. Now, USB devices became, in effect, "hot-swappable" —each time they are switched, the initiation process doesn't need to be performed again. In other words, in emulated USB switching, the characteristics of the attached USB device are recreated once the required switching control information has been removed from the data stream. A neat side effect of the technique is that each computer can be "fooled" into thinking that the USB device is permanently connected to it, even when the device is switched to another computer.



The inside view of a typical enumerated USB switch. The keyboard and mouse are linked to a hub, which then feeds via a simple electronic switch to the selected computer.



The inside view of a typical emulated USB switch. The keyboard and mouse are linked to a host controller (a sophisticated USB hub) and then through to the microprocessor (CPU) which performs the data capture and switching processes.

The currently active connection is then linked via a peripheral controller to the selected computer.



However, although emulated switches cured a number of shortfalls associated with their enumerated cousins, there was still one main limitation to their operation. It remained a complex task to dynamically assume the identity of a USB device, distribute it among the connected computers, and maintain all the necessary signals, states, and processes.

True USB Emulation

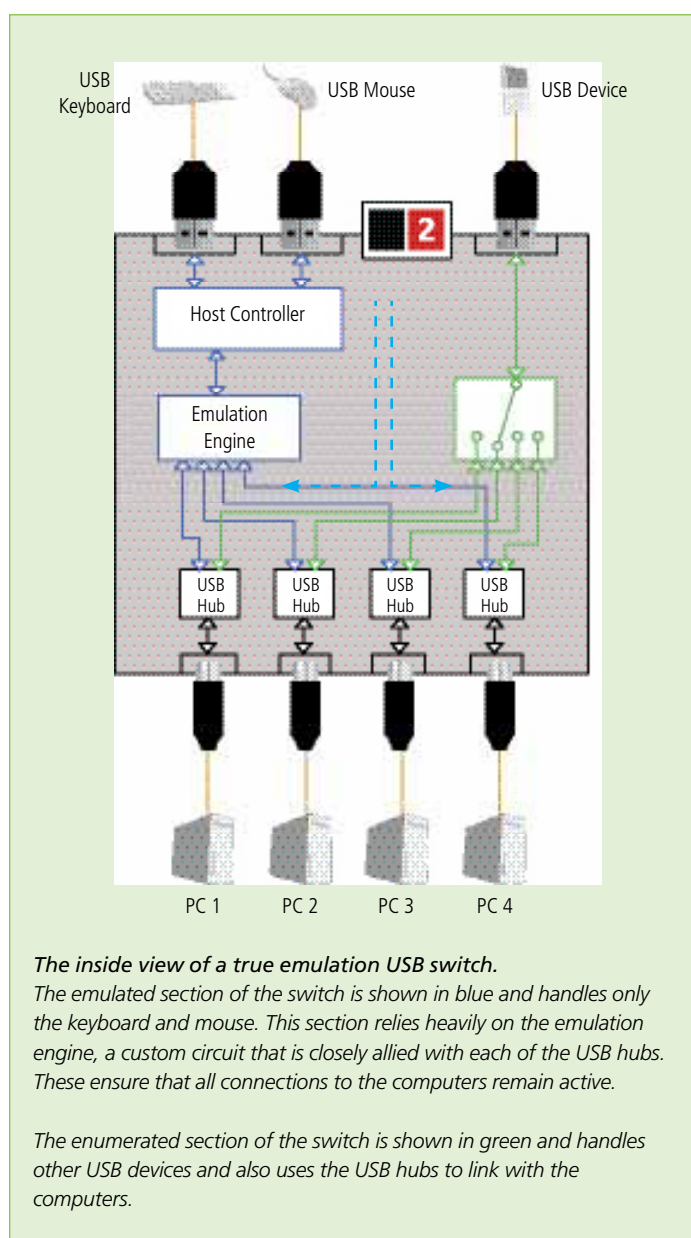
True USB emulation was developed to overcome the limitations associated with even emulated USB switching techniques.

With true USB emulation, the complete identity of the keyboard and mouse can be copied and then presented, fully supported, to all the connected computers. This means that any keyboard offering special function keys or any mouse with extra features will be fully supported at each computer—instantly, with no latency. As with the previous emulation method, the unselected computers continue to see the identities of the keyboard and mouse, which means that no enumeration is necessary when their link becomes active once again. This not only helps to make reconnecting faster, it also increases switching reliability. This is important because USB links are at their most vulnerable during the enumeration process.

A high-speed circuit fully emulates the USB device identities, and it interprets keyboard and mouse data streams. The result is full support for KVM switching via hotkey presses or the third button/scroll wheel of a mouse. For local installations, this is useful; for remote applications, such as KVM over IP, it's essential.

Because other USB devices don't necessarily need the benefits of true emulation like USB keyboards and mice do, there are one or even two enumerated circuits along the true USB emulation feature. This enables the other USB devices to operate at their highest speeds without any intervention. The enumerated circuits benefit greatly from the USB hubs that are jointly used with the true emulation system. Because they interface directly and permanently with each computer, they help to stabilize the dormant links, making errors during enumeration much less likely.

The dual switching arrangement provides further flexibility because the true emulation and enumerated sections can be switched in unison or independently of each other, as required. Thus, various peripherals can operate with different computers at the same time.



Extension Technology and Ergonomics

By Mark Hempel



Trends in control & monitoring solutions

- An increase in digital switching applications.
- An increase in digital video distribution applications.
- A desire for flexibility in controlling visual and peripheral elements.
- A requirement to simplify complex system designs and increase functionality.

Whether your extension and switching application is digital high-definition video, or KVM and matrix peripheral switching, using extenders enables you to remove computer noise and heat from your work area. HD video and peripheral matrix switching and extension enable effective management of broadcast, command and control, and other collaborative environments; flexible control of visual and peripheral elements; and real-time, instant switching and display of HD video and peripherals.

Becoming Ergonomic

All control applications serve one purpose: to help people focus on the applications and processes of their jobs. Ergonomics, or the science of adapting the job and/or equipment and the operator to each other for optimal safety and productivity¹, is the end goal.

Ergonomics is the scientific discipline concerned with the understanding of interactions among humans and other elements of a system. The science of designing user interaction with equipment and workplaces to fit the user has been the cornerstone of technological advances in automation and computer-based systems.

The key elements of ergonomics are silence, a comfortable room climate, flexibility, scalability, service friendliness, and ease of use.

1. Silence and room climate:

- Remove noisy equipment from the operator's desk.
- Keep heaters out of the room.
- Backrack servers in environmentally friendly, climate-controlled server rooms.

Results will enable the operator to focus

more closely on his or her work, rather than on the equipment affecting his/her work. Taking these steps ensures a rich desktop experience. However, you have to be careful to not sacrifice signal quality when bridging the distance between the operator and the equipment.

2. Flexibility and scalability means equipment should:

- Enable relocation and backups easily.
- Leave room for expansion.
- Be able to share systems, signals, and resources.

3. Ease of use and service:

- Enable easy control, steering, and operation.
- Create no technical overhead.
- Keep service and maintenance out of sight of operators.

1. <http://www.osha.gov/SLTC/ergonomics/>

KVM and Peripheral Matrix Switching: What You Need to Know

By Dawn Patton Mangine

Extension Basics

Modern digital extension and switching technology emphasizes the movement from analog to digital video, and also away from fixed-user-to-computer KVM switching toward nearly freely scalable matrices (matrix switching). These new proprietary (using CATx or fiber optic cables) and IP-based digital technologies offer real-time solutions—no delay, no skew. Along with extending digital video, these applications extend keyboard and mouse, digital or analog audio, serial, and USB.

Additionally, the designs that apply to the technologies outlined provide a quieter workplace and remove excess heat from the area by placing computers in low-dust, climate-controlled equipment rooms without sacrificing video quality, picture resolution, or real-time switching of peripherals. Finally, server maintenance, software updates, and network administration become centralized, plus time and cost associated with support is reduced.

Matrix Switch Technology

A matrix switch (also called a crosspoint switch) is an assembly of individual switches between multiple inputs and outputs. In KVM and peripheral switching and extension, matrix switches offer the most flexible, extendable, and efficient configurations for HD video, audio, USB, and RS-232 switching and extension. These new configurations bring better functionality and increased productivity to organizations, especially in the post-production broadcasting and professional audio-visual industries.

The most advanced matrix switches support an array of ports that can be dynamically allocated as input or output. This means that ports can be connected to a CPU or connected to a console, and ports can be switched according to the users' requirements. As long as you have available ports, you can switch in any combination of inputs and outputs—it doesn't need to be a one-to-one configuration (i.e. a 160-port chassis equals 80 inputs and 80 outputs; you can configure it to have 159 outputs and one input if that's what is needed).

The technology supports numerous data streams in varied combinations through extenders: video, KVM, audio, serial, USB 2.0. Because of this updated technology, switching is instantaneous, with no delay.



KVM switching in general is an efficiency-creating solution. These new matrix switching systems take this flexibility and efficiency even further, especially for A/V professionals. Instead of a patchwork of switches and cables, matrix switching systems come with digital or analog audio, serial RS-232, high-speed USB 2.0, and HID tablet support. Additionally, matrix switches free up space in your data center. Plus they're cooler and quieter, eliminating excess noise and heat in the workplace environment.

Along with dynamically allocated I/O ports, some matrix switches enable mixing copper (CATx) and fiber optic cabling. For video-heavy extension over short distances, you can incorporate an HDMI or DVI repeater using native cabling, or an extender kit using proprietary uncompressed technology. For optimal performance over long distances and between buildings, fiber optic cabling is an option as well. Using proprietary cable infrastructure makes collaborative editing much more efficient. Flexible matrix switches enable you to access your expensive editing hardware from remote locations, reducing

travel and meeting times, and making the approval process quicker and easier. In addition to digital video extension, the extenders offer top-quality digital audio support. Actually, the extensive range of extenders available to use with a chassis-based matrix switch offers connections from CPUs and other video sources to monitors, projectors, video walls, and other high-quality displays.

Seamless sharing capabilities enable you to show a video across campus while working with the audio team three doors down the hallway from your office. The HD video and digital audio extension and switching capabilities in a system of chassis, modular interface cards, and extenders gives users an almost endless number of configurations for their applications. Simply put, using a KVM switching solution that is also a matrix switch means zero connectivity barriers. Compact extenders that work with a matrix switch even operate as standalone point-to-point extenders, over CATx or fiber cables—or any combination of cabling an organization wants to use.

Buyer's Tips: KVM Switching Systems

What are the most important elements to look for when buying KVM switches?

IT managers need to consider video type and resolution. What type of USB devices will be connected—HID devices such as keyboards and mice? If specialized keyboards are required, the KVM switch must be able to pass the proper emulation to CPUs. Another question to ask is whether you need audio, microphone, and speakers.

The types of computers you would like to use with the KVM switch and how they connect (DVI, VGA, PS/2, USB, audio, serial etc.) are important elements. Knowing the types of computers you plan on buying in the next five years helps you choose a switch to future-proof your investment. When looking at KVM switches, think about how many more computers/servers you plan on adding in the upcoming months and years. You don't want to fully populate a KVM switch right away and discover you have to get the next size up or find a completely different solution. Also consider how many users will need access to the KVM switch and if you require any IP control (VNC control from a remote office or from anywhere around the world). If all computers/servers/users will be under one roof, consider how far away the computers/servers/users will be from the centralized KVM switch. If any system/user will be farther than 4,5 meters, consider using a CATx-based solution where all computers/users will be interconnected via standard CAT5, CAT5e, or CAT6. Suppliers need to ask these questions to the end client to figure out what they really need and try to suggest options that would potentially save them money down the line.



What are the most common mistakes made when purchasing KVM switches?

The biggest mistake is buying on lowest cost as the only factor without considering future needs.

The most common mistake is buying a KVM switch that will solve your problems for today only.

When this occurs, end users come back to the seller saying that they recently purchased a KVM solution but they bought this new system XYZ that does A, B and C; however the KVM switch was

designed to support D and E. This type of issue will cause the user to either buy a new separate KVM solution or set the system up as a separate entity. Ultimately, this is frustrating to the end user. On more complicated systems that require Server Access Modules (adapters that hang off the back of each PC or server) and various types of accessories for mounting and access, users may mistakenly read a marketing article that tries to sell them a switch only and does not mention that the user is required to have the additional accessories to make it work. If the switch is ordered without these accessories, the installer will get it and be very frustrated. When purchasing the more complicated systems, keep in mind that KVM switches that use any sort of CATx cable will ultimately force you into buying another device that connects to both ends to encode/decode the signals.

Another very common mistake is users purchasing different types of equipment from different manufacturers (KVM switch from vendor A, KVM extender from vendor B, and a KVM tray from vendor C) and being surprised to encounter problems. When performing the initial installation and configuration, 90 percent of these users will realize very quickly that they will have many compatibility issues on their hands. At Black Box, if we suggest a solution that includes connecting more than one system, we make sure to have it fully tested and qualified so the end user will not have to struggle to make it work.



What are the most common options available, and how do you decide which option is best?

Desktop KVM switches have the most common options. The market supports many systems from numerous manufacturers; however, the switches do not all operate the same way. The most difficult thing to understand when looking at these types of switches is the difference in price between various four-port desktop switches. Prices can range from €60 all the way up to €450. When looking at these types of options and trying to compare the price difference, you will begin to notice major items that may not be immediately identified. Some of the major differences between these types of switches are the way the video is supported, having a built-in EDID channel, or the ability to program your own channels. Programming your own EDID channel enables an end user to resolve any video issue they may have later when using different monitors. With a fixed EDID channel in a lower-end switch, you can easily encounter KVM switches that will not render the video correctly (e.g. shifted video, horizontal/vertical bars, no video/no signal, etc.). Between these two types of switches, you will also need to identify the type of USB operation the application requires. The €60 KVM switch may only support USB HID keyboards and mice, and if you attempt to plug in a USB flash drive, external storage device, or any other type of USB 2.0 device, it won't function. On the other hand, the €450 KVM switch should offer the full USB spectrum functionality, and may even support true USB emulation.



What are the key terms and technologies buyers need to be aware of?

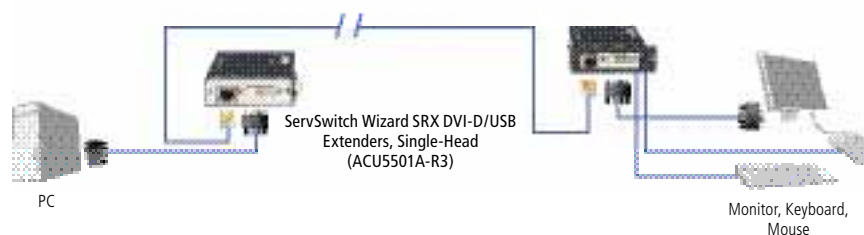
DVI, DVI-D, DVI-I, VGA, 1920 x 1080, single-head, dual-head, triple-head, quad-head, single-link DVI, dual-link DVI, 2560 x 1600, USB 2.0, USB HID, USB enumeration, USB emulation, digital distance limitations (5 m), single-access extension, dual-access extension, desktop, enterprise, multiplatform, multi-layer switching, instantaneous switching, virtual media.



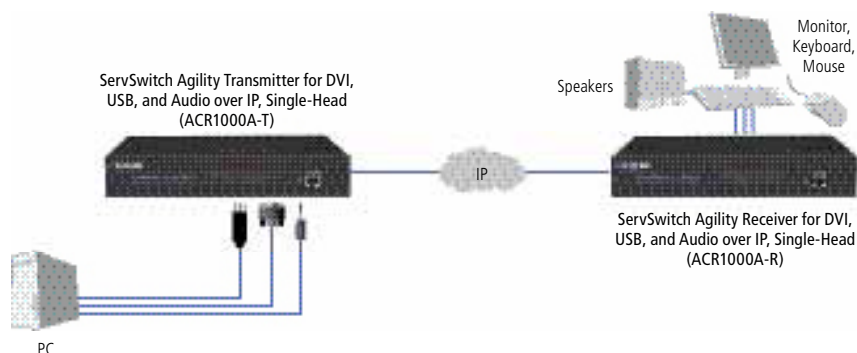
Additional information is available at <http://www.blackbox.fi/KVM>

Transmitters and Receivers: CATx, IP, and Fiber

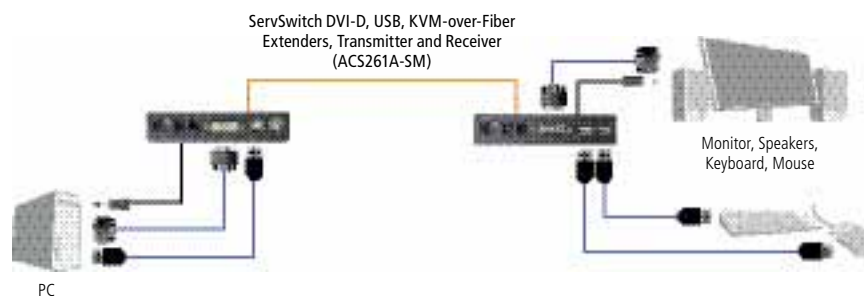
Non-networked CATx extenders, such as the Wizard SRX DVI-D/USB Single-Head Extenders, use transmitters and receivers to extend converted signals over ordinary (non-networked) UTP cabling. They're very cost-effective and enable much longer distances than what's ordinarily possible with digital video cabling.



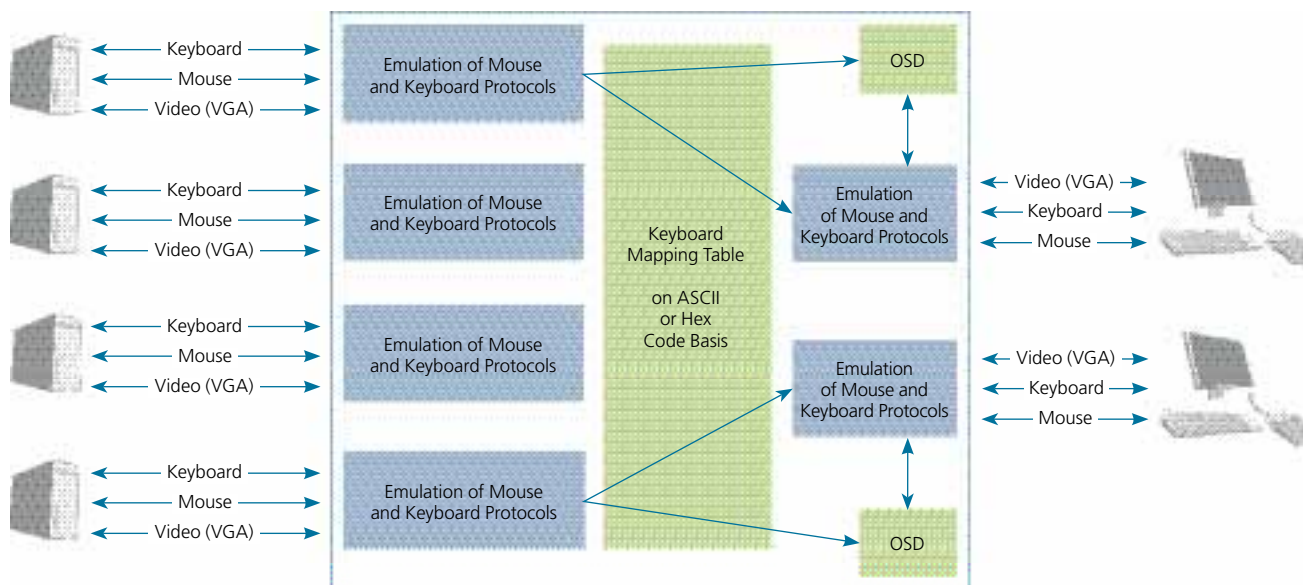
Point-to-point KVM IP extenders use transmitters and receivers to multicast DVI-D video and audio to a distant screen on your network. The transmitter and receiver install directly into your existing LAN infrastructure. An example of this is the ServSwitch™ Agility DVI, USB, and Audio Extenders over IP system, which is available in single-head and dual-head models (ACU1000A and ACR1002A-T and -R).



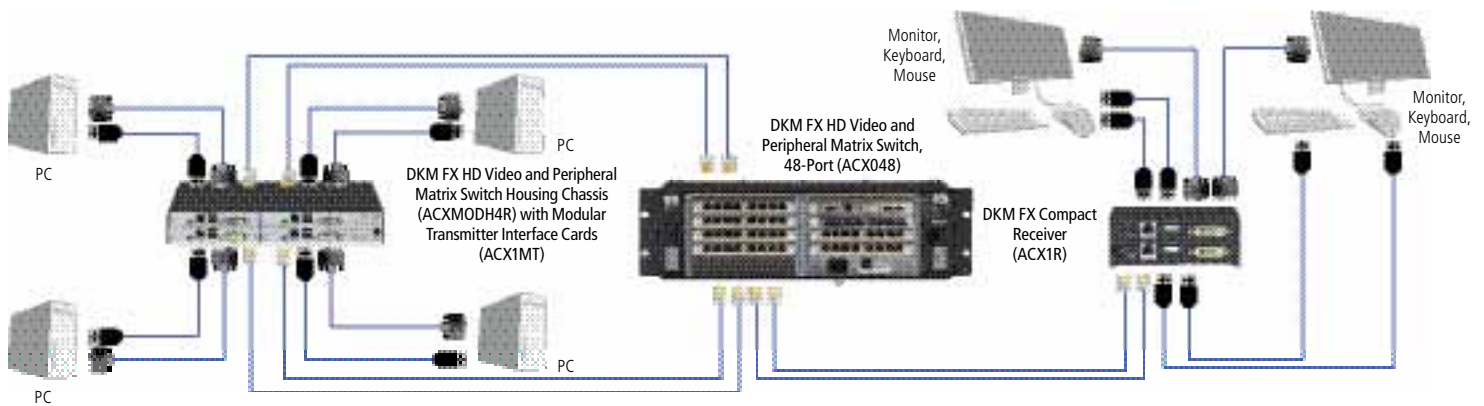
Fiber-based cabling extenders, such as the ServSwitch DVI-D, USB, KVM-over-Fiber Extenders (Single-Mode), use transmitters and receivers to extend digital signals over secure, interference-free (non-networked) optical fiber. These extenders enable you to deliver video at much longer distances than copper.



Functional Diagram—Multiple User Video and Peripheral Switch...



Matrix Switching: CATx and Fiber

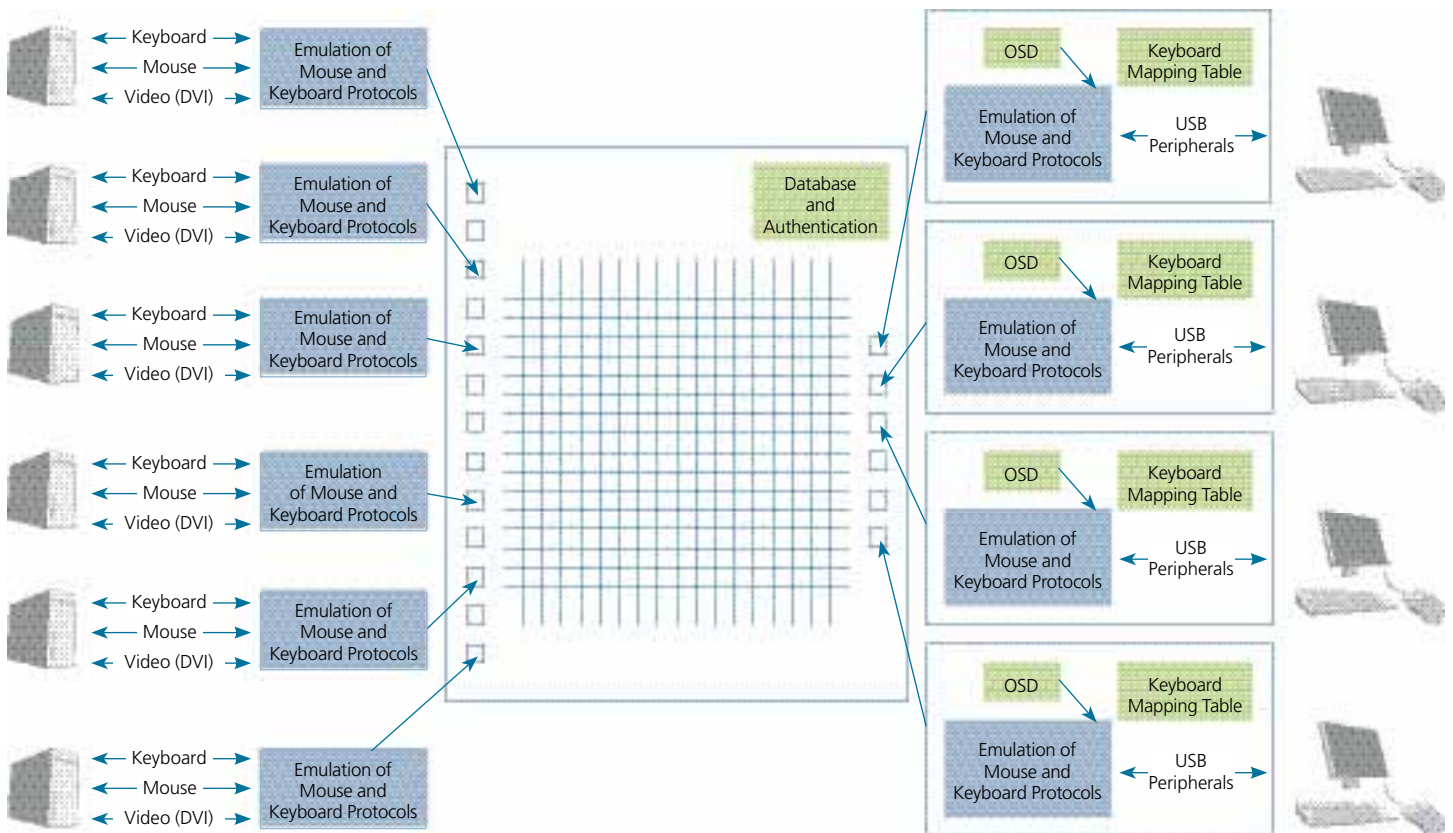


Matrix peripheral switches (also called **crosspoint switches**, or **routers**) extend video, audio, and USB peripherals to any number of computers and CPUs on your network. You can use a system like the DKM FX HD Video and Peripheral Matrix

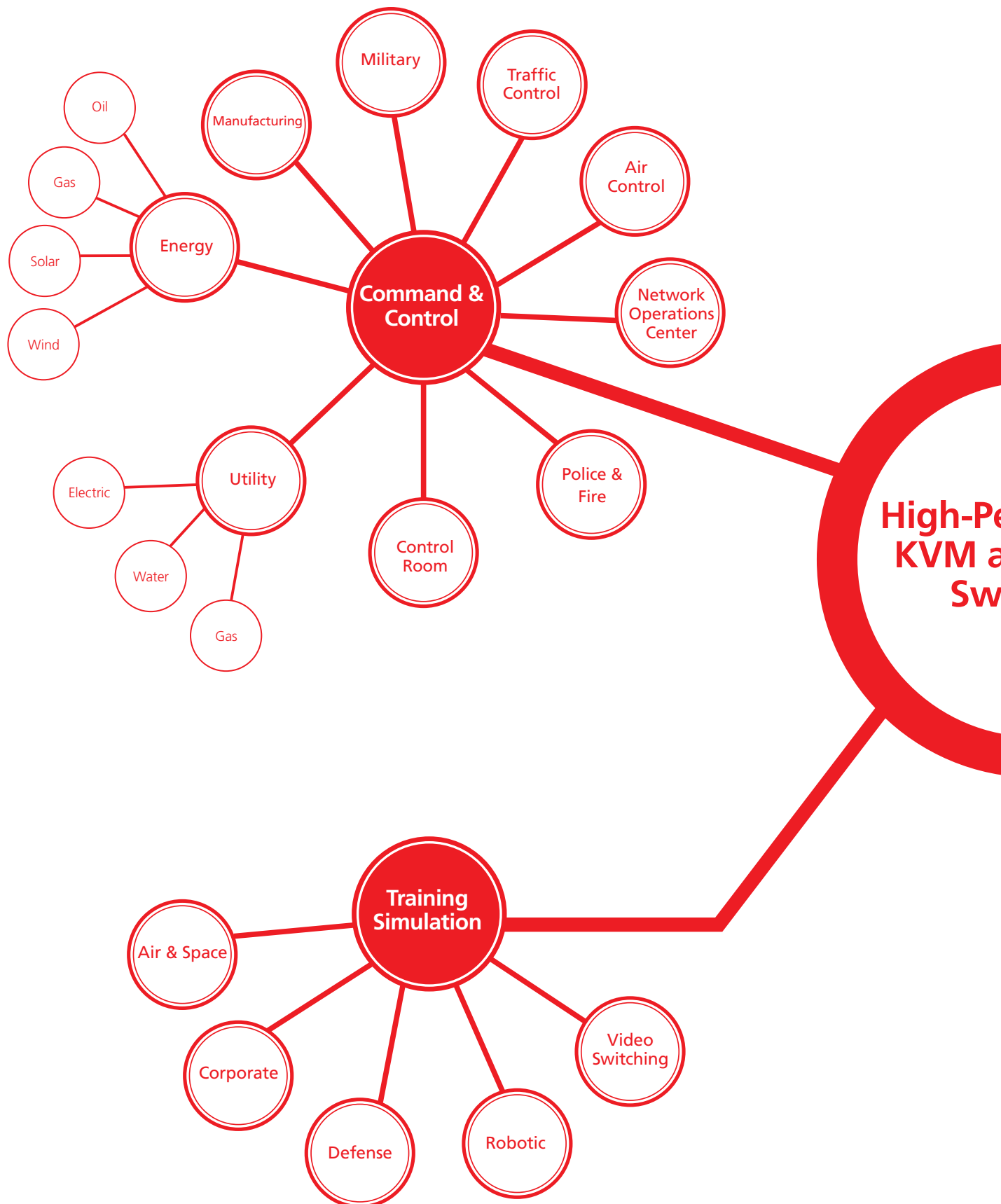
Switching System to distribute HD video and USB over copper or fiber, and all ports on the central chassis are input or output. This kind of chassis-based modular system is flexible, scalable, and highly reliable. It provides instantaneous switching of

HD video and peripherals. It's ideal for broadcast, healthcare, government, and other applications where multiple users need to collaborate and view a variety of media.

...and how it is done in a Proprietary Multiuser CATx/Fiber Matrix



Matrix (or crosspoint) switching of DVI signals and USB peripherals.



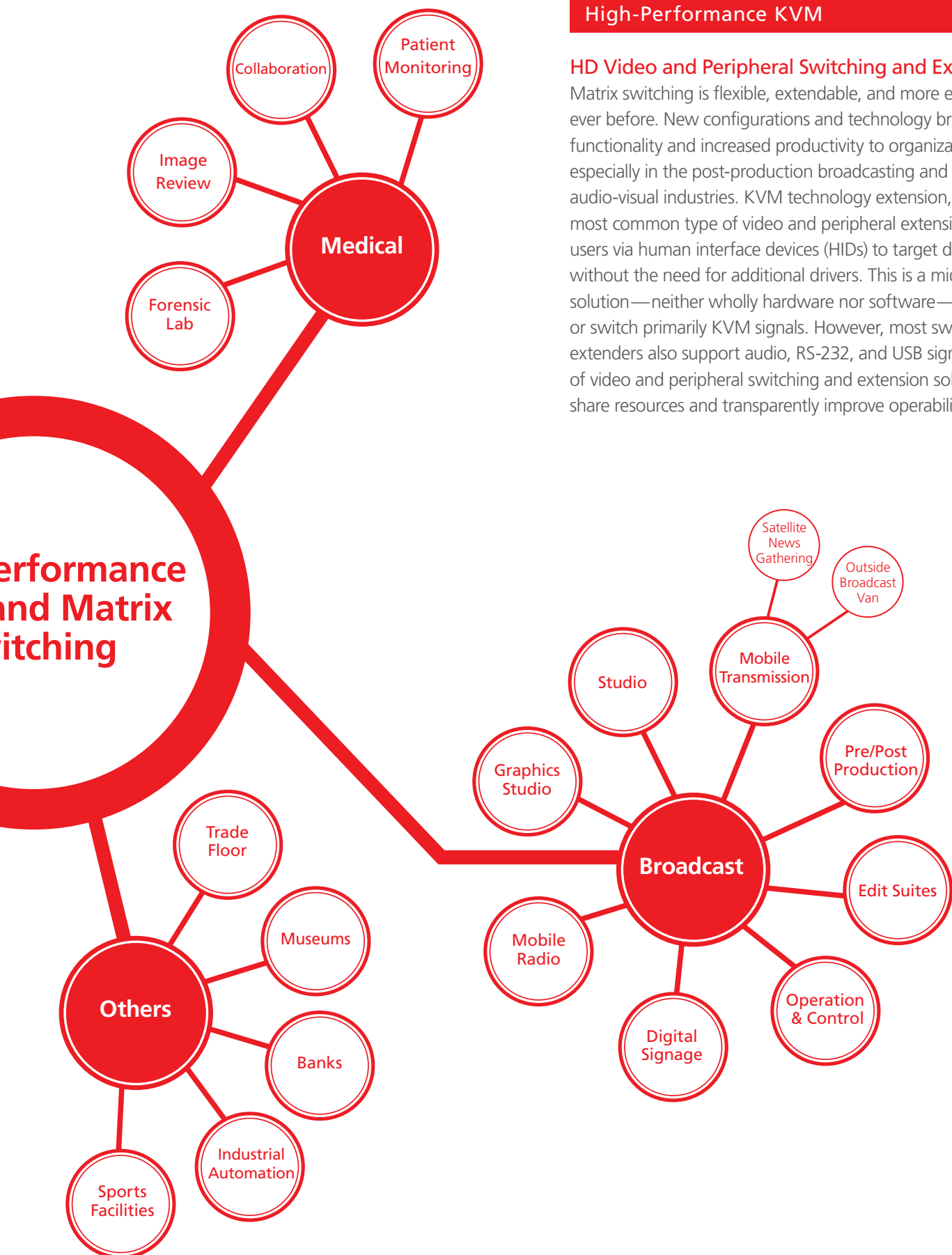
Traditional desktop point-to-point KVM setup.

Performance and Matrix Switching

High-Performance KVM

HD Video and Peripheral Switching and Extension

Matrix switching is flexible, extendable, and more efficient than ever before. New configurations and technology bring better functionality and increased productivity to organizations, especially in the post-production broadcasting and professional audio-visual industries. KVM technology extension, still the most common type of video and peripheral extension, connects users via human interface devices (HIDs) to target devices without the need for additional drivers. This is a middleware solution—neither wholly hardware nor software—to extend or switch primarily KVM signals. However, most switches and extenders also support audio, RS-232, and USB signals. The goal of video and peripheral switching and extension solutions is to share resources and transparently improve operability.



Broadcast and Pre- or Post-Production

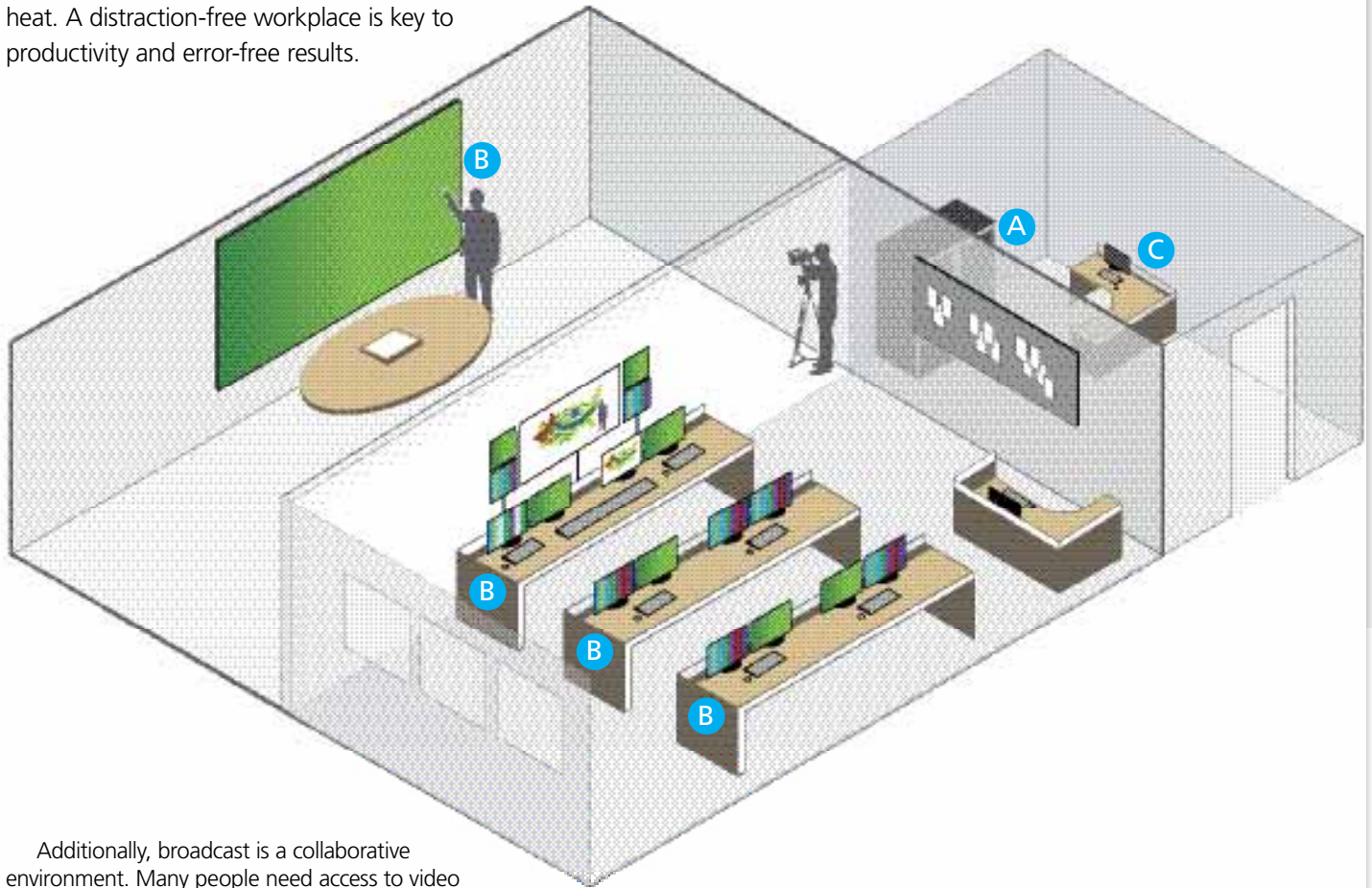
Fast switching, multiuser sharing.

Users, who are directors, presenters, and editors, require an undisturbed work environment. They need to work away from loud or continuous outside noise and unnecessary heat. A distraction-free workplace is key to productivity and error-free results.

A. Transmitters Back-Racked with Servers

B. Presenters, Editors, and Other Users

C. The System Administrator



Additionally, broadcast is a collaborative environment. Many people need access to video and sound for review and editing. They need this access immediately in real time, and the quality of the work has to be very high.

KVM and HD video peripheral switching and extension solutions are ideal for broadcasting environments. They enable access to many users at once, in real time, and to high-definition video signals, audio, serial, and USB peripherals. The configuration possibilities are endless. KVM and video peripheral switching and extension also offer flexible transmission options: CATx cable, fiber optic cable, or IP-based extension.

In the diagram above, KVM and HD video and peripheral extension is used to transmit every required signal from the central equipment room to the end users. **DKM FX extender transmitters (A)** take the signal from a computer and send it over

cabling to the **DKM FX extender receivers (B)**. Receivers provide all the necessary ports for connecting devices needed by the users (keyboard, mice, touchscreens, speakers, USB peripherals). **The system administrator can configure, switch, and manage the system from another workstation (C)** with Web-based management software. Individual extension technologies can easily be combined in a freely scalable, high-performance switching matrix.

KVM and HD video and peripheral extension optimizes broadcast processes by using existing network infrastructure. Video signals, including VGA, DVI-I, SDI, and HDMI can be simultaneously transmitted with peripheral signals. The USB interface ensures that even specialty peripherals such as tablets and touchscreens can be easily integrated.

Broadcasting

The Challenge:

A major broadcast studio wanted to set up a video extension and peripheral matrix switching system over its existing cabling network, which consisted of primarily CAT5e and fiber optic cabling. The system needed to enable forty producers, directors, studio technicians, and operators to gain access to more than sixty computers, servers, video sources, and camera feeds from any desk location.

A competitor's system that had been deployed caused daily problems including delayed switching times, lack of simultaneous access for multiple users, limited device support for USB peripherals, uneven video and audio quality, and unreliable system durability, and it used an older infrastructure that needed to be updated.

The Solution:

The Chief Hardware Engineer of the studio came to Black Box because he had worked with us on a digital signage solution that has been very stable. He wanted an entire switching and extension solution. The studio was responsible for producing live broadcasts, and the list of issues that needed to be addressed was long. The system needed to be as free of glitches as possible, and extremely reliable and flexible. The current system and its faults left end users frustrated and had IT support dealing with endless trouble tickets. Plus, technical support had to be available 24/7 all the way through the process (pre- and post-sale).

The solution decided upon was the DKM FX HD Video and Peripheral

Matrix Switching system, which is a modular system of chassis, interface cards, and extenders. Since time was of the essence, and a site visit was not possible, the Black Box team of product engineers, application engineers, sales specialists, and product managers worked together to review the application and its challenges. Demo equipment was configured at Black Box and shipped to the studio, where the Chief Hardware Engineer was able to configure the setup with online and phone support from our engineering specialists. DKM FX transmitters were installed at each server, computer, video source, and camera feed; receivers were connected to each user station. A single point of management and control was installed



Broadcasting and production studios need access for multiple users and instantaneous switching for live broadcasts and updates.

in the server room and deployed over the existing infrastructure of CAT5e and fiber cable.

Because this HD video and peripheral matrix switching system is incredibly flexible and scalable, the engineer is able to continue to expand his broadcast configuration, adding equipment and users as required. The Chief Hardware Engineer stays in contact with the engineers from Black Box, and often inquires about feature sets he would like to see on our products. Black Box product development and support teams also continually release updated firmware to fulfill this client's needs.

Use in the DKM FX chassis or as standalone, point-to-point KVM extension.

DKM FX and DKM FXC Compact KVM Extenders



*ServSwitch DKM FX Compact Transmitter, CATx,
Single DVI/VGA In/DVI-D Out Plus (2) USB HID (ACX1T-11V-C)*



*DKM FX Receiver, CATx, Dual DVI
Plus USB HID (ACX1R-22-C)*

- Connect users and computers to your DKM FX while extending them simultaneously over long distances.
- Order one transmitter for each computer connected to the DKM FX.
- Use one receiver for each user within the DKM FX system.
- Choose the cable media depending on your distance requirements. Over CATx, go up to 140 meters; over multimode fiber, go 1000 meters; and over single-mode fiber, go up to 10 kilometers.
- Compact housing enables high-density mounting within 19" racks (up to four devices in 1U).
- Peripheral options for USB HID, transparent USB 2.0, RS-232, analog, and digital audio (see KVM Extender section for more options).
- Also work as standalone point-to-point KVM extenders without a DKM FX switch.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

DKM FX Compact Transmitters

CATx

Single DVI-D Plus (2) USB HID	ACX1T-11-C
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1T-11V-C
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1T-14A-C
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1T-13-C
Dual DVI-D Plus (4) USB HID	ACX1T-22-C

Fiber

Single DVI-D Plus (2) USB HID	ACX1T-11-SM
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1T-11V-SM
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1T-13-SM
Dual DVI-D Plus (4) USB HID	ACX1T-22-SM
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1T-14A-SM

To see the complete available range of these extenders, see pages 84-85.

DKM FX Compact Receivers

CATx

Single DVI-D Plus (2) USB HID	ACX1R-11-C
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1R-11V-C
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1R-14A-C
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1R-13-C
Dual DVI-D Plus (4) USB HID	ACX1R-22-C

Fiber

Single DVI-D Plus (2) USB HID	ACX1R-11-SM
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1R-11V-SM
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1R-13-SM
Dual DVI-D Plus (4) USB HID	ACX1R-22-SM
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1R-14A-SM

To see the complete available range of these extenders, see pages 84-85.

Here to help you 24/7.

Combine interfaces depending on your individual needs. These new DKM FX and DKM FXC components are part of a modular system. You need to contact Black Box to have them assembled to fit your application. To configure your DKM FX setup, call our FREE Tech Support at **0201 888 800**.



Flexible, modular KVM extension system takes video, USB, and serial peripherals long distances.

DKM FX Modular Housing and Extender Modular Interface Cards



DKM FX Housing for Modular DKM Extenders (ACXMODH4R)



CATx Interface Card Module:
ACX1MR-DHID-C

- Connect users and computers to your DKM FX while extending them simultaneously over long distances.
- Order one transmitter for each computer connected to the DKM FX.
- Use one receiver for each user within the DKM FX system.
- Choose the cable media depending on your distance requirements. Over CATx, go up to 140 meters; over multimode fiber, go 1000 meters; and over single-mode fiber, go up to 10 kilometers.
- Get DVI-D video with resolutions up to 2048 x 1152 at 60Hz over the full distance, options for VGA in, SDI, and many other analog video formats.
- Peripheral options for USB HID, transparent USB 2.0, RS-232, analog, and digital audio.
- 2-, 4-, 6-, or 21-port housing available with or without redundant power.
- Also work as standalone, point-to-point KVM extenders without a DKM FX switch.
- Compatible with the DKM FX Compact Extenders (ACX1T, ACX1R).
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

DKM FX Peripheral Matrix Switching System

DKM FX Housing for Modular KVM Extenders

- 2-Slot with (1) Power Supply [ACXMODH2-R2](#)
- 4-Slot with (1) Power Supply and Redundancy Option [ACXMODH4R-R2](#)
- 6-Slot with (1) Power Supply and Redundancy Option [ACXMODH6R-R2](#)
- 21-Slot with (1) Power Supply and Redundancy Option [ACXMODH21R-R2](#)

DKM FX Transmitter Modular Interface Cards for Modular Housing

CATx Basic Modules

- Single DVI-D Plus 2 USB HID [ACX1MT-DHID-C](#)
- Single DVI/VGA In/DVI-D Out Plus (2) USB HID [ACX1MT-VDHID-C](#)

Fiber Basic Modules

- Single DVI-D Plus 2 USB HID [ACX1MT-DHID-SM](#)
- Single DVI/VGA In/DVI-D Out Plus (2) USB HID [ACX1MR-VDHID-SM](#)

Upgrade Modules

- Bidirectional Analog Audio Plus RS-232 [ACX1MT-AR](#)
- Analog Audio, RS-232, and Embedded USB 2.0 [ACX1MT-ARE](#)
- Embedded USB 2.0 [ACX1MT-EU](#)

DKM FX Receiver Modular Interface Cards for Modular Housing

CATx Basic Modules

- Single DVI-D Plus 2 USB HID [ACX1MR-DHID-C](#)

Fiber Basic Modules

- Single DVI-D Plus 2 USB HID [ACX1MR-DHID-SM](#)

Upgrade Modules

- Bidirectional Analog Audio Plus RS-232 [ACX1MR-AR](#)
- Analog Audio, RS-232, and Embedded USB 2.0 [ACX1MR-ARE](#)
- Embedded USB 2.0 [ACX1MR-EU](#)

For full features, specs, and additional interface card options, go to www.blackbox.com. For pricing details, call 0201 888 888.

Online configurator

With this tool, you can easily configure a DKM Extender.
For a price enquiry just email us your configuration
or contact our Free Tech Support for advice.

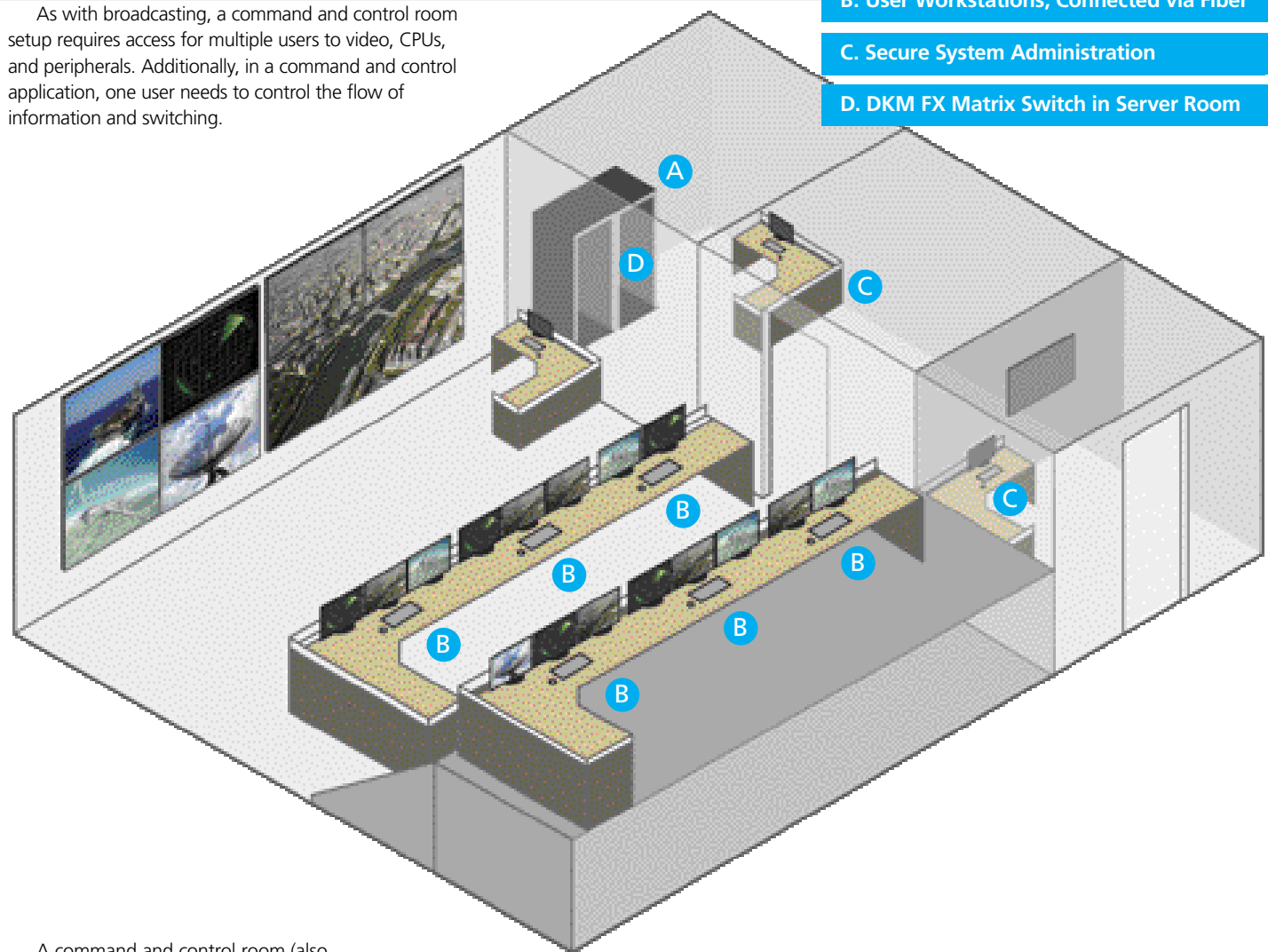
www.blackbox.fi/DKMwizard



Command and Control

Surveying the situation.

As with broadcasting, a command and control room setup requires access for multiple users to video, CPUs, and peripherals. Additionally, in a command and control application, one user needs to control the flow of information and switching.



A. CATx Transmitters, Back-Racked in Servers

B. User Workstations, Connected via Fiber

C. Secure System Administration

D. DKM FX Matrix Switch in Server Room

A command and control room (also referred to as a command and control center) is typically a secure room or building in a government, military, or prison facility that operates as the agency's dispatch center, surveillance monitoring center, coordination office, and alarm monitoring center all in one.

This state-of-the-art matrix and peripheral switching and extension technology offers an array of ports that can be dynamically allocated as input or output. Ports can be connected to a CPU or connected to a console, and ports can be switched according to the users' requirements. As long as there are available ports, you can switch in any combination of inputs and outputs. It's not a one-to-one configuration like you find in most matrix switches.

With the DKM FX switching system, a command and control room setup can be extended through several rooms or buildings. A server room houses servers and the main management switch, plus all the CATx

transmitters (A). CATx is used for the input because it is pre-existing in the infrastructure.

The outputs on the **DKM FX populated chassis (D)** are then fiber optic cables to the **DKM FX receivers at each console (B)** distributed throughout another room (or to other buildings on campus). Using fiber optic cabling increases distance, prevents ground loops, and corrects for voltage differentials.

Video distribution comes from a single workstation, and commanders (administrators) work at the **keyboard/mouse workstations (C)** while viewing video on a quad screen videowall as well. In the setup above, you can see that the DKM FX video extension incorporates a multi-head application.

Industrial

The Challenge:

A petroleum oil company needed a video and peripheral matrix switching and extension system that enabled multiple users to access computers and servers from multiple buildings across campus. Several buildings housed high-end monitoring computer systems that needed to be accessed by users in the main office building.



Users at the NOC in the main office building can easily monitor and access computer systems anywhere on campus.

The Solution:

After a site visit from and consultation with Black Box project engineers and product managers, the DKM FX switching system was proposed. The DKM FX system is comprised of the appropriate hardware for this multiuser application because it enables users to connect and share target computers.

Additionally, since the DKM FX can connect to fiber optic cable and CATx cable at the same time through different ports on the same chassis, the DKM FX is ideal in an extension system that needs to go between buildings on a campus. The DKM FX system supports fiber optic extension, which protects against ground loops and lightning strikes, and can be used between buildings. The main building that housed

the Network Operations Center (NOC) used standard CAT6 copper cabling.

The system distributed on this campus was designed by Black Box specifically for this client. Two of the many advantages of the DKM FX system are its flexibility and scalability. The system of switches, cards, transmitters and receivers, and chassis enable unique configurations for each application and client, and the configurations can easily be planned to accommodate the client's growth.

In this setup, the 80-port DKM FX was installed with a mix and match of 8-port copper and fiber I/O cards. These cards connected to DKM FX transmitters and receivers across campus. Users at the

NOC in the main office can now select, view, and control any of the computers across campus. Because of the mission-critical nature of the business (monitoring oil drilling and extraction equipment), it was recommended that the components have failsafe power supplies to ensure system redundancy. The multiple users of this system can easily log into any user station on campus to access the computers there. From the NOC, users can monitor, view, and control computers, servers, and other computer controlled systems attached to the DKM FX system. Additionally, users can switch among computers and buildings with no delay and regardless of distance.

For flexible and instantaneous crosspoint switching of Full-HD video

DKM FX HD Video and Peripheral Matrix Switch



Watch our video: www.blackbox.fi/DKMvideo

- A scalable, highly reliable HD video and peripheral matrix switching and DVI routing system.
- Very flexible. Any port can be an input or an output.
- Supports high-quality, full-frame digital video.
- Terabit-speed switching backplane.
- Nearly instantaneous video switching within one video frame.
- Full HD compatible. Boasts digital resolutions up to 2560 x 1600.
- Various interface cards available (USB HID/2.0, RS-232, and others).
- Modular, no fixed ports. Moves, adds, and changes are quick and easy.
- Choose from CATx and single-mode fiber SFP modular card interfaces. Single-mode fiber interfaces also work over multimode fiber.
- Enables mixing of media on inputs/outputs—CATx in and fiber out, or vice versa.
- Includes a control card. Manage via KVM, network, or serial console.
- Rackmountable chassis.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

Give multiple users fast, reliable access to high-quality, real-time digital video—plus a whole host of peripherals across the enterprise—with the DKM FX HD Video and Peripheral Matrix Switching system.

This chassis-based, modular crosspoint switching system enables you and others to switch and extend HD video, audio, and serial data over extremely long distances. Use it in any application where many users have to interface with CPUs and other high-end AV equipment supporting high-definition video.

Using non-blocking switch technology, the DKM FX processes and routes DVI single-link resolutions, including Full HD 1080p, with little or no delay of video—even at screens far away from the switching chassis itself.

What's more, it not only supports DVI-D digital video, but also VGA video and connections to a wide array of peripherals, including USB HID, USB 2.0, RS-232, and IR devices, Wacom® tablets, and even legacy PS/2 keyboards and mice.

It's especially ideal for mission-critical control/command rooms, as well as video production or broadcasting applications where HD video is everything. Many users can connect their KVM consoles to various multimedia sources (computer, CPUs, servers, etc.), either locally or in a distant room or office via the switch.

And it's very flexible. The DKM FX HD Video and Peripheral Matrix Switch enables you to configure HD KVM switching and DVI routing exactly as you require. Mix and match fiber and CATx ports through cards and SFPs plugged into its slots. You're not limited in any way.

With the switch, you get a controller card, which has USB keyboard/mouse and DVI monitor connectors for local KVM administration; an RJ-45 port for interfacing with your network and a serial port for control via an external RS-232 device.

OS platform independent, the switch and its controller card can be accessed by Windows®, Linux®, and/or Mac OS® users.

Switches within milliseconds.

Users can switch seamlessly and almost instantaneously with hotkey or on-screen display (OSD) selections on the DKM FX HD Video and Peripheral Matrix Switch. It takes just milliseconds for this to happen (similar IP-based types of solutions can take as long as eight seconds to perform this action).

for broadcast, post-production, and command and control rooms.

Reduces downtime.

Modular in design, the DKM FX enables you to change peripheral and CPU connections on the fly and ensure zero downtime. Add or remove cards and SFPs in the slots and reroute inputs and outputs while the DKM FX system is up and running.

Designed for easy expansion.

Add connections and change inputs/outputs as your enterprise needs evolve. When a department purchases new hardware, just slide a new interface card into the chassis. You can also cascade multiple switch chassis if you exceed the number of available ports.

Signal repeater capabilities are built in.

From its ports, the switch supports device-to-device single-mode fiber links up to 10 kilometers and CATx links up to 140 meters. These links can be to KVM users, DVI sources, servers, and/or various peripherals. However, the switch works with DKM FX Extenders (see the

KVM Extender section for more information) as a repeater station for even longer links. Used midway between an extender transmitter and extender receiver, the switch works as a repeater, essentially doubling your distance—up to 40 kilometers over fiber and 280 meters over CATx. You can even configure CATx on an input or output on fiber, or vice versa, executed with all the previously mentioned configurations. It is often used in control rooms to enable an administrator to troubleshoot or apply updates.

Note:

The DKM FX System is modular. Contact Black Box to have it configured for your application. See our online configurator: www.blackbox.fi/DKMwizard

DKM FX HD Video and Peripheral Matrix Switch

Configurable Housing with (1) Controller Card and (1) Power Supply	
48-Port	ACX048
80-Port	ACX080
160-Port	ACX160
288-Port	ACX288
8-Port I/O Cards for DKM FX Housings	
CATx RJ-45	ACXI08-C
Fiber SFP	ACXI08-SM
High-Speed SFP for 2.5 G Devices	ACXI08-HS
Unpopulated	ACXI08-SFP
Switch System Licenses	
Java and Force Connect	ACX-JAV
External Control over IP/RS-232 (included ACX-JAV)	ACX-API
Seamless Cascading	ACX-CAS
Syslog and SNMP	ACX-SYS
Glide and Switch Function	ACX-GSW

For full features, specs and pricing details, go to www.blackbox.fi

Instantaneous switching of HD video in a smaller model for SMBs and space-conscious organizations.

DKM FX Compact HD Video and Peripheral Matrix Switches



- Use the cost-efficient DKM FX Compact switches to establish connections from consoles (monitor, keyboard, mouse, and other peripheral devices) to various sources, such as computers and CPUs.
- RJ-45 CATx and fiber ports can be input or output.
- Chassis is 1U for easy mounting in server cabinet and racks.
- Use with DKM Modular and Compact Extenders (ACX1MT and ACX1MR series, and ACX1T and ACX1R series) to extend video, KVM, and USB 2.0 signals.
- Can also be run as a video matrix switch.
- Uses fixed configurations for CATx cabling only, fiber cabling only or a mix for extension.
- DKM FX Compact HD Video and Peripheral Matrix Switches serve as repeaters, which mean they can be a maximum distance of 140 meters from console to switch or switch to sources.
- Redundant power supplies included.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

DKM FX Compact HD Video and Peripheral Matrix Switch

CATx only	
8-Port	ACXC8
16-Port	ACXC16
32-Port	ACXC32
48-Port	ACXC48
64-Port	ACXC64
80-Port	ACXC80
SFPs for fiber only	
8-Port	ACXC8F
CATx and SFPs for Fiber	
48-Port CATx & 16 Port Fiber SFP	ACXC48F16
48-Port CATx & 32 Port Fiber SFP	ACXC48F32

For Switch System Licenses, see DKM FX HD above or go to www.blackbox.fi

Go farther, do more, with these digital KVM-over-IP extension, matrix ServSwitch Agility DVI, USB, and Audio Extenders over IP

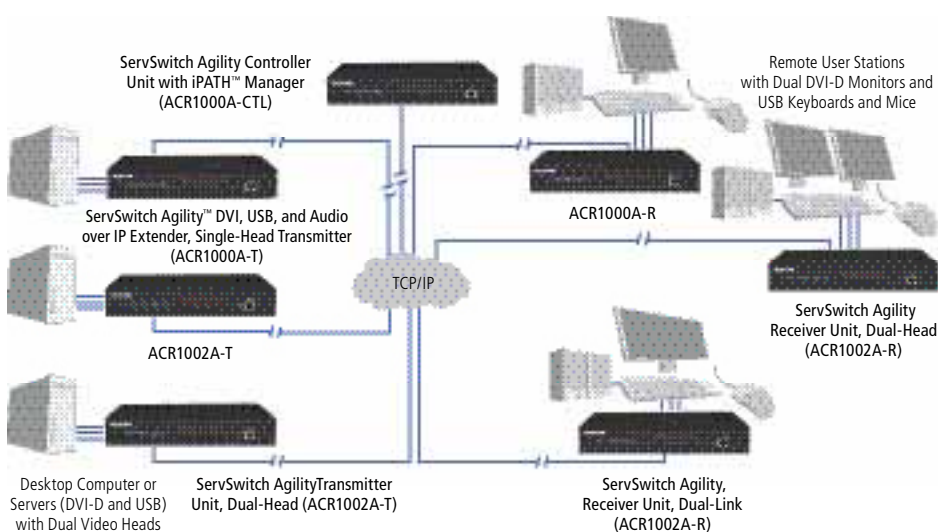


ACR1000A



ACR1002A-T

ACR1002A-R



- Scalable system to grow your network as needed.
- No-loss compression minimizes bandwidth use while maximizing the user experience.
- Configure your network to suit your needs: point-to-point extension, KVM switching, single-target sharing, or multicasting.
- Features keyboard/mouse emulation, and emulation for other standard Human Interface Devices (HIDs), such as touchscreens or flash drives.
- Dual-head and dual-link models available.
- New option with VNC remote access available.
- **Standard Warranty — 2 Years**
- **Extended Warranty — 1 Year or 3 Years**

ServSwitch Agility™ DVI, USB, and Audio over IP Extenders enable you to do more and go farther with perfect digital video over nearly unlimited distances. Standard CATx cabling delivers IP traffic up to 100 meters. For longer distances, add a network switch for an additional 100 meters.

The flexible topology of the Agility gives you extension option applications beyond keyboard-monitor-mouse. The Agility can be a KVM switch, a sharing portal, a DVI extender, and much, much more—it's up to you and how you decide to configure it.

The Agility switching system is useful for multicasting video over an IP network, which makes it ideal for use in digital signage and healthcare, education, and corporate applications where you need to share video content with distant users.

The Agility system consists of a series of transmitters and receivers, including single- and dual-head models. In matrix and TCP/IP

Possible Applications:

- Distribute high-quality medical images to staff across large medical facilities. ServSwitch Agility uses standard Ethernet equipment, so the networking hardware doesn't need to be updated.
- In command and control room setups, multicast video and data to receiver units between LCD display walls.
- Media post-production suites become collaborative. Machine rooms store the media assets and hardware, and can distribute them throughout a post-production facility.
- Get real flexibility for your digital signage network. All you need is an IP network in the installation, and you can easily deliver content from one playout device via DVI.
- Also for digital signage, use the ServSwitch Agility to switch between multiple video sources.
- Deliver rich media experiences in public spaces, such as museums or libraries. The flexibility of the system makes reconfiguring your implementation a snap.

switching, and multicasting solutions.

network sharing applications, you will also need an Agility iPATH Controller Unit (ACR1000A-CTL). It includes a management suite for remotely and securely managing the transmitter and receiver units. Define new content channels, restrict and enable access privileges, push control, and more.

Once you plug the controller into your network, you can begin managing devices, users, and channels. The iPATH™ interface features a useful on-screen dashboard that gives you a current overview of the system. It is continually refreshed so you always have the most up-to-date system information.

Dual-head and dual-link video options

ServSwitch Agility single-head, single-link units support DVI-D resolutions up to 1920 x 1200. The dual-head units support the same DVI-D resolution per video channel, or they support higher dual-link DVI-D resolutions (on one channel) up to 2560 x 1600.

For high-bandwidth applications, the ACR1002A-T and ACR1002A-R are the better choice. With dual-link support, you can use the Agility receivers with extra-large HD screens, such as displays used for broadcasting, digital film, or high-end graphics editing.

Single-target sharing

In this configuration, multiple users can share a single remote computer. Users can connect in three ways. View-only shows only the video feed. In Share Mode, an open connection is available for all users to use the connected devices at the same time. In Exclusive Mode, one user locks out the other users, preventing them from viewing or sharing the connection, with the exception of network administrators.

Multicasting

This unique feature enables the Agility to multicast video and audio over an IP network to several receiving units. To prevent saturating the network, when, for example, a receiver isn't set up to explicitly receive a multicast, an installed network switch should feature Internet Group Management Protocol (IGMP) snooping. This prevents an IP switch from passing on multicast data onto every port, even if it's not part of the Agility system. IGMP snooping reduces the amount of traffic generated by Agility transmitter units that are configured for multicast operations, and prevent performance degradation and wasted network bandwidth.

With the Agility and a network switch that includes IGMP snooping, you can multicast content to as many receivers as you want with no distance limits (depending on the network). This is an ideal configuration for digital signage applications.

ServSwitch Agility DVI, USB, and Audio Extenders over IP

Kit (Single-Head)	ACR1000A
Transmitter, Single-Head	ACR1000A-T
Receiver, Single-Head	ACR1000A-R
Transmitter, Dual-Head	ACR1002A-T
Transmitter, Dual-Head with VCN access	ACR1012A-T
Receiver, Dual-Head	ACR1002A-R
Agility iPATH Controller Unit	ACR1000A-CTL
Limited* iPATH License	
8 End Devices (TX or RX)	ACR1000A-CTL-8
16 End Devices (TX or RX)	ACR1000A-CTL-16
Rackmount Kit	RMKT2004

For full features, specs and pricing details, go to www.blackbox.fi

**NOTE: To upgrade to a full iPATH license, call our FREE Tech Support, 0201 888 800.*

Multicasting video over a LAN: Use the right switch

By Black Box Media Services

Layer 3 versus Layer 2

In KVM extension applications where you want to distribute HD video across a network, you need to use the right network switch.

Think of your network as a river of data with a steady current of data moving smoothly down the channel. All your network users are like tiny tributaries branching off this river, taking only as much water (bandwidth) as they need to process data. When you start to multicast video, data, and audio over the LAN, those streams suddenly become the size of the main river.

Unicasting is sending data from one network device to another (point to point), and usually Layer 2 switches easily support these types of communications. But multicasting is transmitting data from one network device to

multiple users. A Layer 2 switch sends the multicast packets to every device and, if there are many sources, the network will saturate because of all the traffic.

Multicasting with Layer 3 switches is much more efficient because it identifies the multicast packet and sends it only to the intended receivers. Additionally, Layer 3 switches with IGMP support and IGMP querier, "know" who wants to receive the multicast packet and who doesn't. When a receiving device wants to tap into a multicasting stream, it responds to the multicast broadcast with an IGMP report, the equivalent of saying, "I want to connect to this stream." The report is only sent in the first cycle, initializing the connection between the stream and receiving device. If the device was previously connected to the stream, it sends a

grafting request for removing the temporary block on the unicast routing table. The switch can then send the multicast packets to newly connected members of the multicast group. Then, when a device no longer wants to receive the multicast packets, it sends a pruning request to the IGMP-supported switch, which temporarily removes the device from the multicast group and stream.

Therefore, for multicasting, use routers or Layer 3 switches that support the IGMP protocol. Without this support, your network devices will be receiving so many multicasting packets, they will not be able to communicate with other devices using different protocols, such as FTP. Plus, a feature-rich, IGMP-supported Layer 3 switch gives you the bandwidth control needed to send video from multiple sources over a LAN.

Museum

Flexible multicasting over a LAN.

The multicasting of HD video plus peripherals can slow transmission to a crawl, especially if an organization decides to use an IP network. However, new digital extenders can ensure that a creative, flexible, interactive topology is fast as well as effective.



For example, for a science museum with a high visitor rate, interactive touchscreens, and high-definition video graphics displays, point-to-point extension and peripheral extension are vital to an exhibit's success. DVI video needs to be transmitted without any loss of quality.

The ServSwitch™ Agility extends DVI, USB, RS-232, and audio across an IP network with no-loss compression, which minimizes bandwidth use and maximizes users' experiences. By using the Agility and the IP network, interactive displays can receive and project ever-changing content on any number of screens. The Agility enables the delivery of rich media experience in public spaces. Additionally, the flexibility of the system makes reconfiguring your implementation extremely easy. The Agility works in single-head and dual-head configurations as well.

In the diagram above, the ServSwitch Agility transmitters are connected to the museum servers in the data center (A). These transmitters extend high-definition video over the LAN to the appropriate receivers in the museum exhibit, including dual-head monitors (B) and touchscreens (C). The Agility provides very high picture quality, very low video noise, high resolution, and color fidelity. Distance between the displays and the transmitters has no effect on the high performance of the displays. Additionally, in this museum application, video and data are easily multicast to receiver units that are LCD display walls and monitors (D). Users can interact with any of the displays in this exhibit using touchscreen DVI monitors.

Airport

Simplify complex system designs and increase functionality.

No place in the world can be more unsettling or confusing than an airport, not only for passengers but also for employees. Increasing passenger traffic means increased monitoring, and increased monitoring can lead to difficulties or discomfort in the working environment that need to be addressed.

At Norway's third largest airport, the operations center faced a challenging work environment because the airport was expanding its terminal and adding gates to accommodate the growing number of passengers. Technical support staff experienced a warm and crowded workplace as they monitored access control, fire prevention, and general airport security.

In order to improve the staff's environment and, at the same time, make it easier for them to monitor the hardware platform that was responsible for system management, IT decided to backrack extenders. Using the DKM FX HD Video and Peripheral Matrix Switching system enabled this organization to backrack a mix of copper (CATx) and fiber transmitters in the data center and place receivers in different rooms (using CATx) or different buildings (using fiber). This modular matrix setup enabled multiple users to easily access any computer system whether local or remote. Additionally, the employees got a cooler, quieter workplace that increased their job satisfaction and productivity.

At a different airport in Norway, the second largest, the technical division needed to design a more efficient airport operations center as well. In this case, the NOC is a little bit more compact—two desks each with 12 monitors arrayed in two rows. A large-screen monitor attached to a local PC can receive video from one of the desktop computers. They, too, decided to backrack workstation transmitters, but wanted to run everything over copper instead of a mix of CATx and fiber cabling.

This airport opted for the DKM FX Compact HD Video and Peripheral Matrix Switches. These chassis are smaller, but still provide excellent matrix switching and extension capabilities within the DKM FXC system.

These fully digital DKM matrix switch solutions offer switching, extension, and distribution of video, KVM, USB, and audio signals over copper with a maximum distance of 280 meters. The system has a focus on redundancy operation combined with instantaneous switching of high-resolution images.

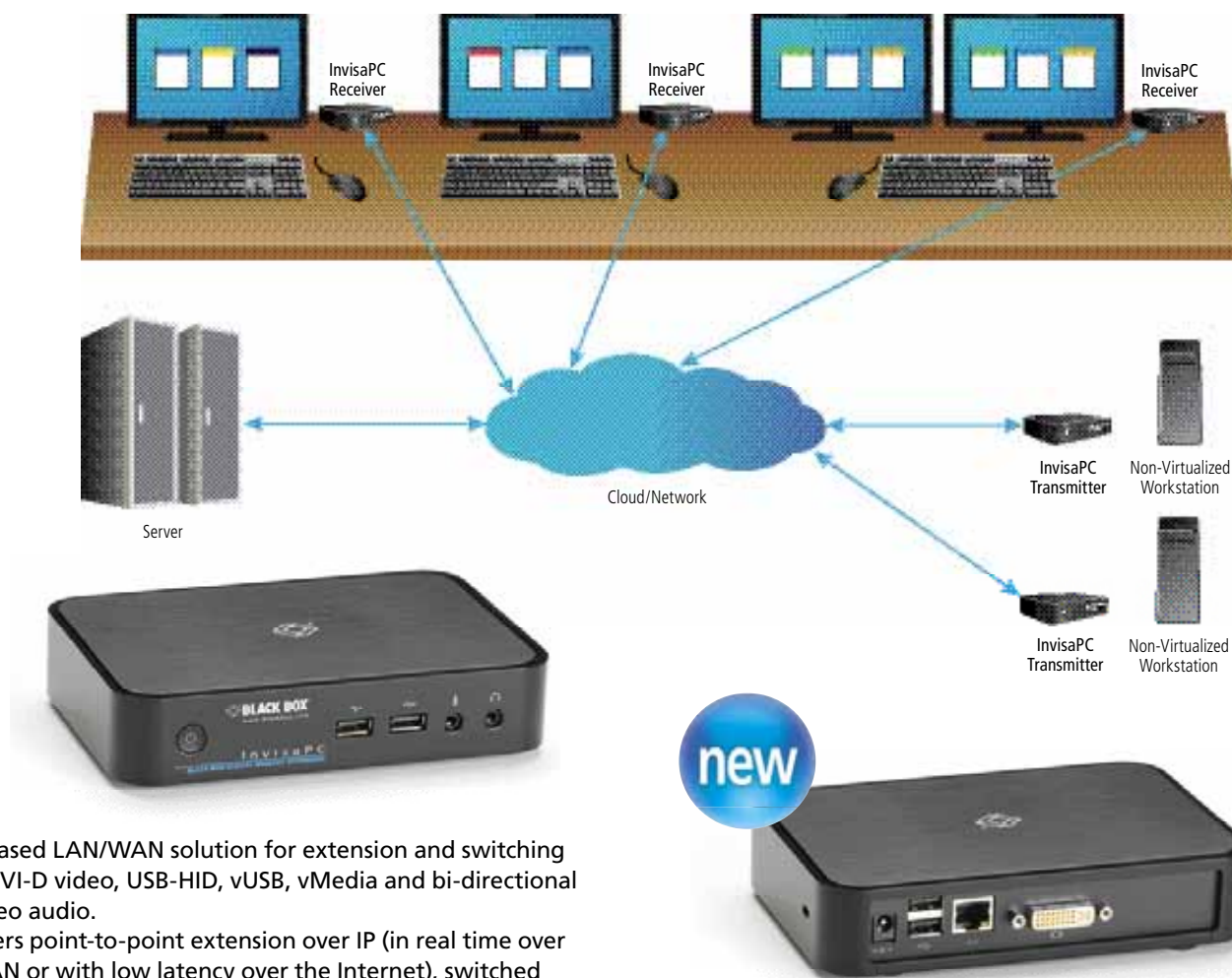
At this airport's NOC, all systems connected to Desk 1 and Desk 2 had a dedicated screen to ensure video is present at all times. One active screen duplicates the active system the team needs to access, usually by using an attached keyboard and mouse. The operator chooses the active system via a 12-button push panel.

As in the former configuration, the workplace is cooler, quieter, and leads to improved functionality.



Make the transition to virtual computing from traditional desktop computing—without compromising performance.

InvisaPC



- IP-based LAN/WAN solution for extension and switching of DVI-D video, USB-HID, vUSB, vMedia and bi-directional stereo audio.
- Offers point-to-point extension over IP (in real time over a LAN or with low latency over the Internet), switched extension with up to 16 targets and up to 16 remote access connections to virtual machines per receiver.
- Extreme low bandwidth requirements with max. 35-Mbps for 1080p motion picture.
- Enables soft migration from desktop computing to virtual computing without sacrificing performance.
- Scalable solution—start small as an extension and grow to a matrix switching system with the ability to add management as needed.
- Remote Desktop Protocol (RDP 7.1/8 with Remote FX) delivers seamless rich media, USB redirection, and enhanced security and compliance.
- Integrates with Microsoft® MS Server 2008 R2 SP1 and Microsoft Hyper-V Server 2008 R2 SP1 for RDP 7.1/8 and Remote FX.
- Single- and dual-head DVI video options.
- Maximum resolution up to 1920 x 1200.
- Compact Fan-less design: 162x110x32 mm improves ergonomics at the user desk.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

Connectivity to Virtual Machines.

The InvisaPC™ bridges the gap between IP-based KVM extension and switching applications and access to virtual machines. Use an InvisaPC receiver as a direct portal to virtual machines, especially Microsoft RDP 7.1 and RDP 8, to redirect digital video, USB keyboard and mouse, audio and vUSB to distant users over IP.

The InvisaPC requires a host with an operating system and associated Client Access Licenses (CALs). However, the InvisaPC doesn't require any drivers or software to be installed on computers. This hardware-based solution is plug-and-play, directly connecting to the network interface right out of the box.

Traditional Point-to-Point Extension over IP.

With the InvisaPC solution, computers are removed from the desktop and are relocated within a secure, climate-controlled equipment room connected to an InvisaPC transmitter. Each user has his/her own keyboard, monitor, mouse, and peripheral setup connected to an InvisaPC receiver delivering a high performance real time experience. It's just like running any application on a local CPU without any performance issues.

The clients and the back-racked servers are connected via standard LAN or WAN infrastructure. The bandwidth requirements of the system are very low. For example, with the InvisaPC, transmitting a 1080p movie only requires 35-Mbps bandwidth. The low bandwidth requirements even allow an extension over the Internet with very low latency or sharing even corporate networks without utilizing too much bandwidth.

Switched Extension.

Connected to a Virtual Machine, one InvisaPC receiver supports up to 16 RDP, RDP7.1/8 targets. The same receiver can also be connected with up to 16 InvisaPC transmitters/servers. That way each InvisaPC receiver supports switching between 32 soft and hard targets. The settings can be copied from one receiver to another to ease the setup, while user profiles may be configured on the receiver to restrict targets. Multiple receivers may be used to create a matrix switch via the network, too without any management requirements.

Adapts to growing needs.

InvisaPC can easily be adapted to meet your requirements. Start with a small switching system that enables one user access to different computers and virtual machines. Gradually, the system can be expanded into a switching matrix. Future management software will also allow larger switching matrices, as well as integration into existing network authentication systems such as LDAP or Active Directory.

Flexible remote access ensures a convenient working environment.

The clients operate extremely quietly — no fan noise to distract users from their work. The power consumption is about 3 watts per unit which, compared to a desktop PC, is 100 times more energy efficient. The InvisaPC client, with its space-saving design, can even be mounted behind the monitor screen.

Moving to cloud computing with a zero client device like the InvisaPC enables IT managers to make their department more flexible and responsive.

Soft migration from real to virtual machines.

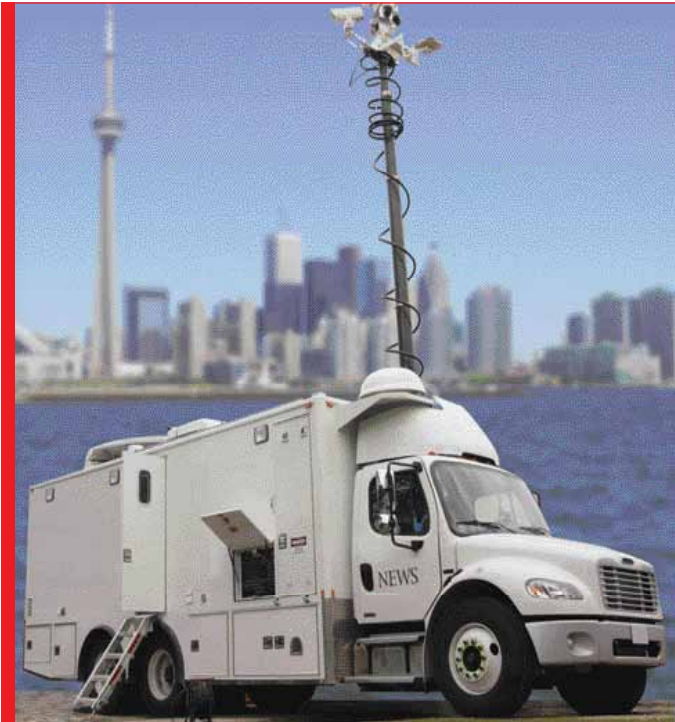
The InvisaPC solution provides the ability of a smooth migration from real desktops towards a virtual server landscape. The system provides integrated support for back-racked PCs and virtual desktops. In particular the design addresses applications with a mix of both worlds — without changing the front end for the user. Desktop virtualization is deployed through a PC or server that hosts multiple virtual desktops. The workstations can be running Mac®, Linux®, or Microsoft® operating systems using an InvisaPC transmitter. Using an InvisaPC transmitter, the system supports digital video, digital audio, and USB peripheral extension across IP networks. It is standards-based, so there are no upgrades to equipment, software licensing, or remote management — plus, no time-consuming IT visits.

Real cost savings.

InvisaPC optimizes cost-effective deployments by basing the scale of the deployment on the solution need. It can be scaled from branch offices to large enterprise corporations. Plus, lower power consumption translates into lower utility bills for you.

InvisaPC	
Transmitter, Single-Head	DTX1000-T
Receiver, Single-Head	DTX1000-R
Transmitter, Dual-Head	DTX1002-T
Receiver, Dual-Head	DTX1002-R
Accelerator Card, Supports 32 VM on (1) Server	DTX1000-C

For full features, specs and pricing details, go to www.blackbox.fi



Broadcasting Applications

Mobile Broadcasting: Outside broadcast vans (OBVs) and satellite news gathering (SNG) vehicles are often equipped beyond their approved weight loads. With the InvisaPC onboard, heavy computers are replaced with a single server with multiple virtual machines. In no way does this switch compromise the number of requests or performance. Additionally, the solution means more room in a small space, reduced noise, and reduced heat and thermal radiation from multiple computers.

Graphic Design: InvisaPC enables graphic artists in various fields to share expensive software hosted on one or multiple back-racked target computers. For instant orders, the user will always get immediate remote access to the server pool. Even for design applications requiring high performance, InvisaPC users experience no difference at the display, and no drop in usability compared to a local workstation.

The IP KVM extender, matrix switch, and multimedia solution.

PLATFORMS	CONNECTORS	PERIPHERALS	SWITCHING	FEATURES
 PC  Sun™  Mac®	 PS/2  USB  DVI-I	 Spkr./Mic  USB	 OSD  IP	 Upgradable

ServSwitch DTX



*ServSwitch DTX receiver (DTX5002-R):
top: front view; bottom: rear view*

- Extends a USB computer's KVM, audio, and USB 2.0 peripheral signals hundreds or even thousands of miles over an IP network to a workstation with one or two DVI-I monitors, speakers, and a USB keyboard and mouse.
- Features USB virtual media (VM) support.
- Connect up to four USB 2.0 devices to a receiver.
- Encrypts media streams for Secure Socket Layer (SSL) connections over a TCP/IP link.
- Using the extender's password-protected serial interface menu, you can configure network connections, change video settings, perform flash upgrades, configure hotkeys, and more.
- Supports PC, Sun™, and Mac® CPUs and works with Windows®, Redhat® Linux, Sun Solaris™, and Mac operating systems.
- Support resolutions up to 1920 x 1200 at 60 Hz.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

The ServSwitch™ DTX extends KVM and multimedia long distance over any IP network. It extends a USB CPU's KVM, audio, and USB peripheral signals hundreds or even thousands of miles over an IP network to a workstation with a DVI monitor, speakers, and a USB keyboard and mouse.

Like a traditional KVM extender, the ServSwitch DTX has a transmitter unit for your CPU and a receiver unit for your workstation. As long as you have an IP link between your CPU and workstation, the DTX provides secure, high-quality connectivity. USB peripherals attached to the DTX at your workstation operate as if they're directly connected to the CPU, even if the CPU itself is continents away.

Multiplatform, multimedia KVM extension.

ServSwitch DTX works with just about any computer and operating system software. As a KVM extender, the DTX provides complete hardware KVM extension—no startup and configuration software is needed. When the receiver powers up in a point-to-point application, the system automatically establishes a connection between the transmitter and receiver. To view DTX system configuration, simply access the receiver's on-screen display (OSD).

The DTX displays 24-bit, 60-fps color video and supports resolutions up to 1920 x 1200. In addition, it supports DVI and VGA for

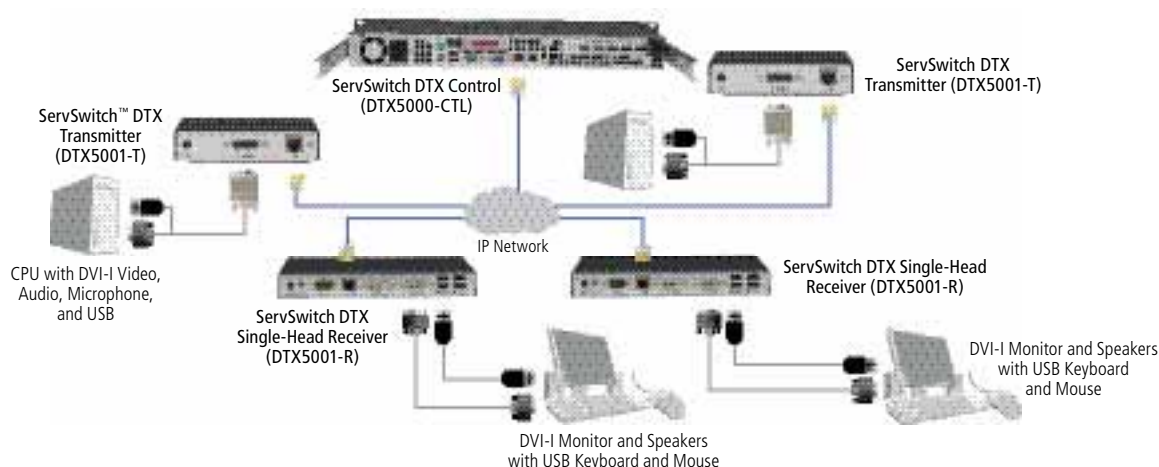
universal video compatibility, plus it delivers CD-quality sound for robust audio extension. For demanding multimedia applications, just connect the DTX to either Fast Ethernet or Gigabit Ethernet.

The ServSwitch DTX Single-Head components (DTX5001) support in-line conversion of video signals. In other words, if you input digital signals, you can output analog signals and vice versa. The DTX5001 supports DVI-D or VGA signals, as well as USB 2.0 and audio.

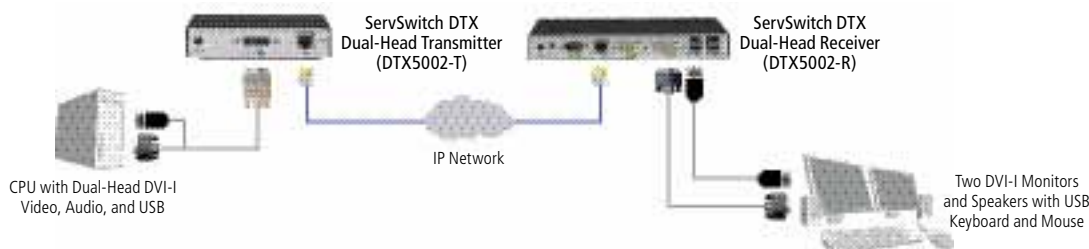
The dual-head DTX (DTX5002) supports DVI-D only, no conversion. Dual-head receivers enable you to use two DVI-I monitors at a remote workstation. It also supports USB and audio signals.

The ServSwitch DTX Control appliance is a KVM management system that enables matrix switching, control, and authentication capabilities. With IT systems being spread out through the use of virtual data center, distributed and cloud computing, and KVMoIP systems such as the DTX, keeping track of servers, data resources, and users is getting complex. Management systems enable you to compile a single list of IP resources and a single list of users and their access rights. With a management system, you can add, edit, or eliminate users from a single appliance instead of using a checklist and going through multiple switches and logins.

KVM Matrix Switching with USB Virtual Media over IP



Dual-Monitor DVI Extension over IP



Keep your communications secure.

With the ServSwitch DTX, you can place your CPU in a safe location to protect it from the dust and vibrations of an industrial environment, and you can secure it from would-be thieves by locking it away in a cabinet or control room.

Furthermore, the DTX encrypts media streams for Secure Socket Layer (SSL) connections over a TCP/IP link. For more advanced control, just connect a networked computer running emulation software to the receiver. Using the extender's password-protected serial interface menu, you can then perform administrative and maintenance tasks for both the receiver and transmitter.

Use it point-to-point, too.

You can also use the ServSwitch DTX in a point-to-point configuration as you would any other copper extender. Maximum distance is 100 m between the CPU and the KVM workstation.

ServSwitch DTX

ServSwitch DTX Single-Head, VGA, DVI-D, USB 2.0, and Audio
Transmitter
Receiver

DTX5001-T
DTX5001-R

□ includes (1) transmitter or receiver and (1) autosensing power supply.

ServSwitch DTX Dual-Head, DVI-D, USB, and Audio
Transmitter
Receiver

DTX5002-T
DTX5002-R

□ Dual-head units include either (1) transmitter or (1) receiver, (1) autosensing power supply.

ServSwitch DTX Control Appliance

DTX5000-CTL-R2

ServSwitch DTX Transmitter Power Supply

DTX5000-PS-R2

ServSwitch DTX Receiver Mounting Plate

DTX5000-MMK

ServSwitch DTX Receiver, Silencer Housing for Desktop/Wallmounting

DTX5000X-R-SIL

ServSwitch DTX Receiver 19" Rackmount Kit for (1) Receiver incl. Power Supply

DTX5001-R-RMK

DVI-I Male-VGA HD15 Female Adapter

FA461

DVI-I Female-VGA HD15 Male Adapter

FA462

For full features, specs and pricing details, go to www.blackbox.fi





SMB and Server Room KVM Solutions

Stepping into the Server Room

A common mistake made by small to mid-size organizations looking for system management solutions is to prioritize cost over value. When exploring KVM technology, it's important to plan for the future. KVM and switching systems are flexible and scalable, so they can grow with your organization—but you need to know what to plan for. What accessories do you need for your switch? What features do your switches need to have, not just for installation today, but for months and years down the road? The last thing SMBs need are separate KVM components that don't work together or systems that can't be extended. Finally, never underestimate tech support. Having someone to talk to 24/7 before and after your purchase is key, and so is having the engineers testing compatibility and qualifying components to make sure they all play well together!



Reduce clutter and save space in the server room with rackmountable KVM console trays.

By Dawn Patton Mangine

KVM tray technology



What we do that others don't.

From the solid construction of our KVM trays to unique features like LEDs on the front panel and integrated KVM switching, Black Box's KVM trays are miles ahead of the competition.

Nothing reduces clutter in a server room like KVM trays that are 1U high, and mount in a cabinet or rack. Here are some of the features that set our KVM trays apart.

High-resolution support.

This type of monitor uses thin-film transistor (TFT) technology to improve image quality, resulting in higher resolutions, better image contrast, and addressability. All our KVM trays support TFT LCD panel monitors.

Wide viewing angles.

The screens on our KVM trays are viewable from nearly any angle. Because of the size of our screens, from 15" to 19" viewing angles vary from 140° x 120° all the way up to 160° x 160°, so you don't always have to be standing directly in front of the monitor to see what's happening on it.

Fits any display rack.

On the ServTray Complete family of KVM trays, we have moved from a variety of rear bracket sizes to one adjustable length. This universal rail rear bracket size fits racks with depths of 23.7" (60.2 cm) to 45.3" (115 cm). This simplifies ordering for you!

Open monitor, closed door.

Dual-rail KVM tray technology enables the monitor drawer and the keyboard/mouse drawer to move independently of each other. It makes it easy to leave the monitor visible even when a server cabinet is closed and the keyboard/mouse drawer is fully retracted. Black Box has added switching controls to the monitor bezel that can be used to control an attached switch without pulling open the keyboard/mouse drawer for even more space-saving benefits.

Additionally, the dual rails provide a great monitoring environment without disturbing your cooling system.

You asked for it.

Our latest KVM trays, the ServView V KVM Drawer and ServView V KVM Drawer with Widescreen were designed based on

feedback we have received from some of our customers.

On the front panel of the tray, there is an LED panel, which helps you locate the drawer when it's closed in a darkened data center. The tray only takes up 1U of rack space, and it features the dual rail technology described earlier.

We added front-panel controls for switching, so if you choose a model with an embedded KVM switch, you can use the buttons on the monitor bezel without pulling out the keyboard. Additionally, the top of the keyboard tray features a hideaway connection for USB wireless devices, such as RF- or Bluetooth® supported keyboards and mice. You can wirelessly access your attached targets, without even opening the cabinet door!

Another feature is the front-panel USB port, which provides crash cart access (KVT100A). If your keyboard or Glidepoint® mouse quit on you, simply use this port to attach a passthrough pointing device.

Finally, the widescreen version supports 1920 x 1080 resolutions and DVI connections—two firsts in the data center.



A USB hideaway at the top of the keyboard/mouse tray enables you to install a wireless USB keyboard and mouse (RF or Bluetooth).

No KVM console in your server room? No problem. Plug a laptop into the server for quick BIOS-level control.



USB Laptop Console Crash Cart Adapter

- Gives you a fast, easy way to log in to a server or computer to troubleshoot or service a system after a crash.
- Handheld adapter plugs into the server on one end and your laptop on the other.
- No drivers to install on the target computer.
- Includes software for viewing server video on your laptop, without having to reboot or change the server in any way.
- Scale the video window as needed and even take a screen snapshot.
- Works with Windows® and Mac® OS X laptops.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

Remedying a server problem in a room without a local user console used to mean wheeling in the “crash cart,” a rolling cart loaded with a keyboard, monitor, mouse, and a bunch of connecting cables for on-the-spot computer access.

But with the USB Laptop Console Crash Cart Adapter with integrated cabling, you have a compact and easier way to get immediate, BIOS-level access to your server.

Despite its name, there's no actual “cart” involved. In this case, the cart is the laptop that you carry to the server and, using the adapter, plug in to obtain quick server access.

Connect to the video port of any server in trouble to perform emergency system recovery, carry out routine system maintenance, or do whatever server task you like—just as if you had a full KVM console with a VGA monitor connected to the server itself.

The fully hot-pluggable adapter requires no external power (it gets it all from the connected system or laptop), making it truly portable and easy to use.



How it works.

Emulating a USB keyboard and mouse, the USB Laptop Console Crash Cart Adapter and its software enable you to interact with the target server as a window on your laptop.

For server connections, the adapter has built-in VGA video and USB keyboard/mouse connectors. On the laptop side, it features a high-speed (480-Mbps) USB Mini Type B connector with a detachable USB cable for server-to-laptop links. For older PS/2 style keyboards (the adapter doesn't support PS/2 mice), there's a passive PS/2 to USB adapter included.

Versatile video scaling options.

There's no need to load any drivers or software on the server—all the software goes on your laptop.

And it's no ordinary terminal emulation software. The adapter's software gives you real-time video scaling so you can always see the entire screen, even on small laptop displays. Enlarge the window to use all pixels of your laptop (with or without the laptop taskbar seen), or shrink to view another application next to it. Video adjustments also include sample phase sharpening and video noise filtering.

What's more, upon rebooting the connected system, the software interface gives you command line interface and BIOS-level visibility from start to finish.

You can even take screen snapshots (as PNG or JPEG files) for system analysis later.

Possible Applications:

- Performing maintenance in server rooms without a lot of space, where you can't fit a crash cart or install a KVM console tray in the rack or cabinet.
- Classrooms where the server or CPUs are stored in the back of the room and you need quick access to diagnose a problem while students are actively working at their computers.
- Troubleshooting ATMs, kiosks, and retail PoS/PoP systems in stores and other areas heavily trafficked by the public.
- Configuring digital signage in real time at the screen, away from the controlling PC (just plug the adapter into the player).
- Any field application where you need to interact with target computers.

USB Laptop Console Crash Cart Adapter

USB Laptop Console Crash Cart Adapter

KVT100A

□ Includes (1) adapter with built-in VGA and USB cables, (1) passive PS/2 to USB keyboard adapter, (1) USB Mini Type B male to USB Type A male cable, and (1) flash drive with software and user's manual.

For full features, specs and pricing details, go to www.blackbox.fi

Rackmountable, dual-rail, 1U console drawers for when space is at a premium.

PLATFORMS	CONNECTORS	CABLE	PERIPHERALS	SWITCHING	FEATURES
PC	PS/2 USB VGA DVI-I	Composite	USB	OSD Hotkey	Cascadable

ServView V KVM Drawer ServView V KVM Drawer, Wide Screen

- Dual-rail console drawers feature keyboard, touch pad, and LCD monitor in only 1U of rack space.
- Keyboard and LCD display slide in and out independently, enabling the monitor to remain visible while keyboard is stored.
- Flip-open 17" standard LCD panel supports resolutions up to 1280 x 1024; the wide screen supports up to 1920 x 1080, and 1920 x 1200.
- Front-panel USB port remains accessible to peripherals even with keyboard and mouse tray closed.
- Optional KVM switch function module connects to VGA or DVI, and either PS/2 or USB servers.
- KVM selection from front of the monitor.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



ServView V (KVT517A-XXX) with LCD panel open and keyboard and mouse tray drawer open.



For even more convenience and versatility, the top of the keyboard/mouse tray features a hideaway USB port for USB HID-supported wireless keyboards and mice (RF or Bluetooth).

ServView V KVM Drawers offer server management in a space-saving, streamlined package. The trays include a keyboard, touch pad, and a high-resolution 17" TFT LCD panel (choose standard or widescreen), all housed in an industry-standard 19" 1U rack drawer, saving you valuable cabinet space. For even more space savings, switch selection buttons on the monitor bezel enable you to switch between servers with only the LCD panel open. Hotkey switching is also an option.

Remote control.

For remote server control with space-saving KVM tray technology, consider **CATx Integrated KVM Tray Modules**. These switching options are for use with ServView™ V and ServTray™ Complete KVM Trays.

Control up to 16 multiplatform computers from your KVM tray console, with expansion options to increase the number of servers available. Use convenient network-style CATx patch cables—thin, flexible cables that are popular in racked applications, such as our Gigabase® CAT5e cables (EVNSL81, etc.). Add USB, PS/2, and Sun style server access modules (SAMs) for each server connection.

These switching modules offer various port configurations and remote access options. The non-IP modules provide a KVM extension port that enables a second KVM console to access the switch from 300 meters away

using standard CATx cabling and a ServSwitch CX Remote Unit.

The KVMoIP modules enable network users to control the switching module from a computer on the LAN or WAN using a VNC viewer or Web browser. For high availability, order KVT517A-16CATX-4IP, which enables up to four KVMoIP users to simultaneously access different computers. It also offers support for up to a total of 16 RS-232 terminal targets using the **KV1407A** SAM.

Control made easy.

Save space by using the switching controls on the monitor bezel of the ServView V to control the switching module without pulling open the keyboard drawer. The top of the drawer has an LED lighting bar to make the closed drawer easy to find in a dark cabinet.

You can install a USB RF or Bluetooth® adapter in the hide-away at the top of the keyboard/mouse tray to access the ServView V and servers with your own wireless keyboard.

Crystal clear.

The standard ServView V features a sharp LCD screen with up to 1280 x 1024 resolution. The wide-screen ServView V provides an even broader view with up to 1920 x 1080 resolution and a DVI interface.



ServView V (KVT517A-XXX) with LCD panel open and keyboard and mouse tray closed.



KVM switch selection buttons on the monitor bezel (above) enable switching between servers with only the LCD panel open.



All models have an LED bar on the front (above) that enables you to easily find your closed tray in a darkened server room or data center.



ServView V Wide Screen (KVT517A-8DV-WIDE) with LCD panel open and keyboard and mouse tray closed.

Support for VESA DDC 1/2B enables the monitor to automatically adjust to its optimum performance when connected to a server that supports DDC.

Note:

The drawers come with an US keyboard design. Please call Tech Support for other desired keyboard layouts prior to ordering: 0201 888 800.

What's included•

- ServView V KVM tray
- KVM switch module (except for the single-port model)
- Power supply
- Power cord
- Universal rear rail kit:
 - (2) brackets
 - (2) extenders
 - (8) screws
- User's manual
- Single-port model also includes computer cables for connection to USB or PS/2 devices

ServView V KVM Drawers

Single-Port, DVI, VGA, USB, PS/2	KVT517A-1UV-R2
with 8-Port KVM Switch, VGA, PS/2	KVT517A-8PV
with 8-Port KVM Switch, VGA, USB, PS/2	KVT517A-8UV
with 16-Port KVM Switch, VGA, PS/2	KVT517A-16PV
with 16-Port KVM Switch, VGA, USB, PS/2	KVT517A-16UV
with 8-Port DVI KVM Switch, Wide Screen	KVT517A-8DV-WIDE

You may also need...

PS/2 Cables	
1.8-m	EHN70001-0006
3.0-m	EHN70001-0010
User Cables	
1.8-m	EHN9000U-0006
3.0-m	EHN9000U-0010

CATx Integrated KVM Tray Modules with ServView V

8-Port, CATx	KVT517A-8CATX
16-Port, CATx	KVT517A-16CATX
8-Port, CATx with IP	KVT517A-8CATX-1IP
16-Port, CATx with IP	KVT517A-8CATX-1IP
16-Port, CATx with IP, 4 User	KVT517A-16CATX-4IP

□ Include KVM tray with keyboard, touchpad, and LCD monitor, 8- or 16-port KVM module, power supply, Universal Rear Rail kit, and user's manual.

ServSwitch CX Server Access Modules

PS/2	Basic	KV1400A
	with Audio	KV1402A
USB	Basic	KV1401A
	with Audio	KV1403A
	with DisplayPort and Audio	KV1408A
	with Mini DisplayPort and Audio	KV1409A
Sun	with Audio	KV1404A

To connect a remote console to any of the switches using CATx cable, order...

ServSwitch CX Remote Units		
PS/2	Basic	KV04-REM
	with Audio and Skew Compensation	KV04AS-REM
USB	Basic	KV04U-REM
	with Audio and Skew Compensation	KV04AUS-REM

For full features, specs and pricing details, go to www.blackbox.fi

Make your server room more functional without sacrificing space—

PLATFORMS	CONNECTORS	CABLE	SWITCHING	FEATURES
PC	PS/2 USB VGA	Composite	OSD Hotkey	Cascadable

ServTray Complete ServTray Complete with Integrated IP KVM



- Reduce clutter in your server room.
- Choose from integral 1-, 4-, 8-, or 16-port KVM switches.
- Options for IP-integrated KVM trays also available.
- Mounts in a standard 19" cabinet or four-post rack with depths from 23.7" to 45.3".
- Includes a full-sized keyboard and a touchpad with an ergonomic hand rest.
- A front panel conceals the unit when not in use.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

The ServTray Complete adds an integral KVM switch to its keyboard, monitor, and mouse and packs it all into only 1U of rack space. It mounts on standard 19" rails in any standard server cabinets and enables you to manage as many as 16 PS/2 or USB servers or a combination of the two.

Remote control.

For remote server control with space-saving KVM tray technology, consider **CATx Integrated KVM Tray Modules**. These switching options are for use with ServView™ V and ServTray™ Complete KVM Trays.

Control up to 16 multiplatform computers from your KVM tray console, with expansion options to increase the number of servers available. Use convenient network-style CATx patch cables—thin, flexible cables that are popular in racked applications, such as our Gigabase® CAT5e cables (EVNSL81, etc.). Add USB, PS/2, and Sun style server access modules (SAMs) for each server connection.

These switching modules offer various port configurations and remote access options. The non-IP modules provide a KVM extension port that

enables a second KVM console to access the switch from 300 meters away using standard CATx cabling and a ServSwitch CX Remote Unit.

The KVMoIP modules enable network users to control the switching module from a computer on the LAN or WAN using a VNC viewer or Web browser. For high availability, order KVT417A-16CATX-4IP, which enables up to four KVMoIP users to simultaneously access different computers.

Save space, increase efficiency.

Designed for heavy-duty use, the ServTray Complete can replace that bulky local workstation you've been using. Just slide out the drawer and open the flat-screen monitor.

The ServTray Complete features a full-sized 105-key keyboard—no trying to type on tiny keys too small for your fingertips. The touchpad includes an ergonomic hand rest.

When you're done, simply slide it back in place. The front panel conceals the unit when not in use.

Choose the size that's right for you.

The ServTray Complete can accommodate switching modules with 4, 8 or 16 ports or a 1-port connection module.

Once you've selected your switch module, choose the cables for 4-, 8- and 16-port models. The single-port model comes complete with cables, so you don't need to add them.

Easy mounting.

The ServTray Complete includes a universal rear rail kit, which mounts the ServTray on the front and rear rails with a depth of 23.7" to 45.3" — that's rail depth, not total cabinet depth, so if you have extra-deep cabinets, the ServTray will still fit as long as the rail depth is within limits.

Both ServTray and its switch module are powered through an autosensing 100- to 240-VAC power supply that plugs right into the nearest power strip or PDU.

these trays are a compact 1U and slide closed with no fuss.



16-Port CATx-1IP module
embedded in the ServTray Complete



16-Port CATx-1IP module

Technical Specifications

Approvals	CE, RoHS
Active Display	(24) or (48) RJ-45 to (24) or (48)
Backlight Unit	4 CCFLs edge-light (top/bottom)
Brightness	250 (center)
Connectors	(1) Centronics® 36 M, Native, RJ-45
Contrast Ratio	450:1
Display Color	262 K colors
Environmental	Operating Temperature: 0 to 50° C; Operating Humidity: Up to 95%, noncondensing
Input Signal	RGB analog, H/V separate
Pixel Pitch	0.294 mm (H) x 0.294 mm (V)
Resolution	1280 x 1024 @ 60 Hz
Viewing Angle	-80 to +80 (H), -80 to +80 (V)
Power	Input: 100-240-VAC, 47-63Hz Output: 12 VDC; Draw: 33 watts
Dimensions	4.4 (1U) x 43.2 x 49.5 to 100.3 cm (hwxwd)
Weight	10.4 kg
Keyboard Designs	Belgium = BE; Danish = DK; English UK = UK; English US = US; Finnish = FI; French = FR; German = DE; Norwegian = NO; Russian = RU; Spanish = ES; Swedish = SE; Swiss = CH

ServTray Complete

- 17" Screen
- PS/2 or USB
 - 1-Port Module [KVT127E-XX](#)
 - 8-Port Switch Module [KVT127E-XX-8MP](#)
 - 16-Port Switch Module [KVT127E-XX-16MP](#)
- PS/2 only
 - 8-Port Module [KVT127E-XX-8P](#)
 - 16-Port Module [KVT127E-XX-16P](#)
- DVI and USB
 - 4-Port Switch Module [KVT127E-XX-4DU](#)
 - 8-Port Switch Module [KVT127E-XX-8DU](#)

CATx Integrated KVM Tray Modules with ServTray Complete

- 8-Port, CATx [KVT127E-XX-0IP08](#)
- 16-Port, CATx [KVT127E-XX-0IP16](#)
- 8-Port, CATx with IP [KVT127E-XX-1IP08](#)
- 16-Port, CATx with IP [KVT127E-XX-1IP16](#)
- 16-Port, CATx with IP, 4 User [KVT127E-XX-4IP16](#)

☐ Include KVM tray with keyboard, touchpad, and LCD monitor, 8- or 16-port KVM module, power supply, Universal Rear Rail kit, and user's manual.

ServTray Complete Server Cables (*NOTE: You'll only need cables for 8- and 16-port models; cables are included with the 1-port model.*)

- PS/2 Only
 - 1.8-m [KVT127-P-1.8M](#)
 - 3.0-m [KVT127-P-3M](#)
- PS/2 or USB
 - 1.8-m [KVT127-U-1.8M](#)
 - 3.0-m [KVT127-U-3M](#)

For each CATx server connection, you need...

ServSwitch CX Server Access Modules

- | | | |
|------|----------------------------------|-------------------------|
| PS/2 | Basic | KV1400A |
| | with Audio | KV1402A |
| USB | Basic | KV1401A |
| | with Audio | KV1403A |
| | with Audio and Display Port | KV1408A |
| | with Audio and Mini Display Port | KV1409A |
| Sun | with Audio | KV1404A |

Replace the **XX** in the code for the desired keyboard layout.

Ergonomic 17" KVM drawer with native 1920 x 1200 images



ServView Full HD

- 19" KVM tray with 17" display, full-sized keyboard and glide pad.
- Native 1920 x 1200 resolution supports 50Hz modes.
- VGA, DVI, S-Video & composite video formats reduce TCO.
- Picture-in-Picture display mode.
- Full HDCP support.
- USB or PS/2 keyboard/mouse ports.
- Emulation for 3-button mouse (Unix copy/paste)
- Available with multiple international keyboard layouts.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



ServView Full HD combines an ergonomic layout in a shapely design with state-of-the-art technology. Manufacturing techniques and components are construed for high availability and a long life circle. Ergonomics ensure that even harshest use has no impact on cables due to bends or tiredness.

High Native Resolution

The brilliant LCD display with 17" diagonal screen size supports a full as well as picture-in-picture display. In addition to digital DVI video also analog video formats like VGA, S-Video and composite video are supported. With a native resolution of 1920 x 1200 at 50Hz, the KVM tray is ideal for use in video broadcast applications.

USB Connectivity

Unique is the feed-through, easy accessible USB bus for memory sticks, and other USB peripherals at the front. As a perfect add-on for modern KVM Switches with Virtual Media or true USB-Switching, it allows fast and convenient patch up-dates of the attached servers from memory sticks, etc.

Modular Layout and Installation

The adapter plate at the rear side accepts a variety of KVM-Switches without any additional need of rack space.

The keyboards are available in 15 language designs and very quickly to be replaced. (Please call our Free Tech Support for available options).

The glide pad features a special design for rack usage that prevents from accidental use with the heel of hand.

An adjustable cantilever beam ensures proper cable ducting. For fast installation, telescope rails from 600 to 900 mm depth are already pre-mounted. All fixing material including cables are delivered with the tray in a stable shipping box.

Design

Tender rounded edges and a console area without screws complete the premium effect.

The 17" display keeps it's position through high quality hinges and ensures relaxed ergonomics, in addition, an interlock prevents from accidental slide-in.

With it's modern design, the KVM tray doesn't need to be hidden in a rack. Use it on exhibitions and for other representative purposes and highlight your tomorrow's alignment.

Technical Specifications

Display	17" TFT wide LCD display
Resolution	1920x1200@50Hz
Colors	16,7 Mill. (true colour)
Brightness	typical 400 cd/cm2
Contrast	600 : 1
19" rackmount	1U height; 600-900mm depth through integrated telescope rails
Size	483W x 495D x 44H mm
Connectors	(1) DVI-I; (1) HD15 F VGA; (1) MD 4-pin S-VHS; (1) cinch Comp.; (1) Schuko power; (1) USB type B F (front feed); (1) USB type A F front; (2) MiniDin6 F K/M; (1) USB type B F K/M;
Power	100-240-VAC, 50-60Hz internal
Keyboard Designs	Arabic=AR; Belgium = BE; Czech = CZ; Danish = DK; English UK = UK; English US = US; Finnish/Swedish = FI; French = FR; German = DE; Italy = IT; Norwegian = NO; Portuguese = PT; Russian = RU; Spanish = ES; Swiss = CH

ServView Full HD

USB Keyboard/Mouse **KVT1920E-XX-U**
PS/2 Keyboard/Mouse **KVT1920E-XX**

Please replace -XX with your desired keyboard design (see specs for more details)

For full features, specs, and pricing, go to www.blackbox.fi

The perfect starter KVM switch for smaller offices with basic switching needs.



ServSwitch EC KVM Switch for PS/2 and USB Consoles and CPUs



KV9004A: front



KV9204A: rear

These basic KVM switches are ideal for SMBs ready to expand into multiple server management KVM systems using native cable. The ServSwitch EC KVM switches are very cost effective because they work with PS/2 and/or USB consoles and servers, making them perfect for basic desktop switching.

Additionally, the ServSwitch EC series is ideal for areas where you have a limited amount of space. The 1U-high ECs can be used on a desktop or mounted in a rack or cabinet. (Brackets are included with the 8- and 16-port models.) To save more space, the KVM circuitry is concentrated in a single connector at the server end. This way, you have fewer cables to install when making server connections.

Because the ServSwitch EC is plug-and-play, you can add or subtract servers almost as quickly as you can plug and unplug cables.

Switch between servers using front-panel buttons or hotkeys. Or with autoscan, the ServSwitch EC will scan and switch between servers, one by one, at an interval that you determine. When autoscan detects any keyboard

or mouse activity, it suspends the scanning until activity stops, and then resumes with the next computer in sequence.

The front panel includes port LEDs, which light with the corresponding active port when you switch between servers.

In addition, all models feature on-screen display. Through this OSD, you can assign 14-character server names that make sense to you, view the connection status by port, and lock servers from unauthorized users.

What's more, the ServSwitch EC stores system settings and name entries in nonvolatile memory, and saves your keyboard settings for each server, restoring them when you come back to that machine.

What's included

- (1) power supply
- (1) set of foot pads
- (2) brackets
- (1) user's manual

- Manage multiple CPUs from a single desktop.
- Ideal for non-mission critical installations.
- Resolutions up to 1920 x 1440 (VGA only).
- Operating system independent and transparent to all applications.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

ServSwitch™ EC

for PS/2 Servers and Consoles

4-Port	KV9004A
8-Port	KV9008A
16-Port	KV9016A

for PS/2 and USB Servers and PS/2 Consoles

4-Port	KV9104A
8-Port	KV9108A
16-Port	KV9116A

for PS/2 and USB Servers and PS/2 or USB Consoles

4-Port	KV9204A
8-Port	KV9208A
16-Port	KV9216A

For your CPU connections, order...

ServSwitch EC Server Cable

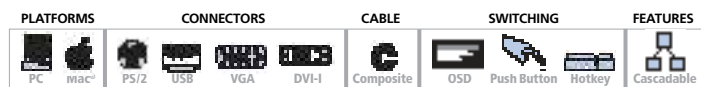
PS/2	1.8-m	EHN70001-0006
	3.0-m	EHN70001-0010
	4.5-m	EHN9000P-0015
	9.1-m	EHN9000P-0030
USB	1.8-m	EHN9000U-0006
	3.0-m	EHN9000U-0010
	4.5-m	EHN9000U-0015

To add a serial device (to enable both KVM management with serial console management), order...

Serial Module [KV9-SRL](#)

For full features, specs and pricing details, go to www.blackbox.fi

The simple plug-and-play KVM switch with 8 or 16 ports and DVI video—ideal for small server rooms.



ServSwitch EC DVI + USB



- Resolutions up to 1920 x 1200.
- Single-link DVI USB KVM switch with USB/DVI console connections.
- Operating system independent and transparent to all applications.
- DDC2B compatible for use with the latest digital monitors.
- 8-port switch is 1U; 16-port switch is 2U; both are ideal for smaller server rooms.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

The ServSwitch EC are for applications where you have a limited amount of space. The 1U, 8-port or 2U, 16-port DVI switches can be placed at a desktop without hogging space or mounted in a 19" cabinet or rack. As with the other EC switches, to save more space, the KVM interface is concentrated in a single connector at the server end. This way, you have fewer cables to install when making server connections.

This ServSwitch EC steps up the video resolution, giving users sharp, clear DVI single-link signals. With video enhancement technology that ensures superb quality and resolutions up to 1920 x 1200, these DVI switches are DDC2B compatible. Use them with digital monitors without worrying about delay or skew.

Switching is managed with front-panel buttons or hotkeys. The switches also have autoscan to scan and switch between servers, one by one, at an interval that you determine. When autoscan detects any keyboard or mouse activity, it suspends the scanning until activity stops, and then resumes with the next computer in sequence.

System settings are stored in nonvolatile memory, preventing an accidental power outage from wiping out stored information. The ServSwitch EC switches save your keyboard settings for each server and restore them when you come back to that machine.

Technical Specifications

Approvals	CE, RoHS
Connectors	KV9508A: Console: (1) DVI-I F (digital only); (2) USB Type A F (keyboard and mouse); Computer: (8) DVI-I F (digital video only); (8) USB Type B F (keyboard and mouse)
	KV9516A: Console: (1) DVI-I F (digital only); (1) VGA F (analog only); (2) USB Type A F (keyboard and mouse); Computer: (16) DVI-I F (digital video only); (16) USB Type B F (keyboard and mouse)
Operating Systems	Windows® 98 SE/Me/2000/XP; Windows 7; Windows Vista; Linux; Mac OSX; Solaris
Power	Input: 100–240 VAC, 50–60 Hz; Output: 9–12 VDC, 2 amps (max.)
Dimensions	KV9508A: 4.45 x 43.8 x 17.8 cm; KV9516A: 6.6 x 43.8 x 22.8 cm
Weight	KV9508A: 2.3 kg; KV9516A: 3.8 kg

ServSwitch EC for DVI + USB

8-Port
16-Port

[KV9508A](#)
[KV9516A](#)

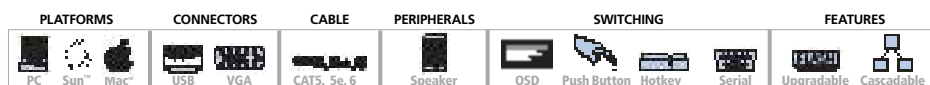
To add a serial device (to enable both KVM management with serial console management), order...

Serial Module

[KV9-SRL](#)

For full features, specs and pricing details, go to www.blackbox.fi

High-end, multiplatform KVM switching over CATx cabling with remote access capabilities.



ServSwitch CX Uno



KV0161A



KV04U-REM

- Set up CATx-based local and remote KVM access to 8 or 16 CPUs or servers—switch from a KVM console up to 300 meters away.
- Supports resolutions up to 1920 x 1200 at 60 Hz and offers DDC EDID display support.
- Slim and compact. Connect to as many as 31 cascaded servers in 1U of rack space.
- Switch remotely using RS-232 commands and set up synchronized switching of multiple units—great for multi-head video applications.
- Available with stereo audio support, too.
- Assign three levels of users for access security.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

Small size, big delivery.

Less than half the width of a standard 19" mountable device, the ServSwitch CX Uno supports up to 31 cascaded servers in 1U of rack space. Added to a KVM drawer like the ServView V KVM Tray (KVT517A) or ServTray Complete (KVT127E), it's an ideal solution for dense server rack environments.

The CX series is a step up from the ServSwitch EC series of switches. First of all, the CX is a multiuser KVM switch, making it ideal for growing organizations. Second, the CX units are still economical in size, making them perfect for desktops or for rackmounting in a server room—even, as mentioned, cascading with a KVM tray for even greater server management options.

Remote access option via CATx.

With the Remote Access Modules for the CX Uno for PS/2 or USB (KV04-REM or KV04U-REM series), a remote user has access to the attached servers from more than 300 meters away using a single CATx cable.

Remote control option.

Like all CX series switches, the CX Uno can be switched remotely via RS-232 commands. You can also synchronize the switching of multiple units, enabling support for multi-head video.

Note:

Works with our ServView Tray V and ServTray Complete Trays (KVT517A, KVT127E)

ServSwitch™ CX Uno

4 Users x 16 CPUs	KV0081A
4 Users x 42 CPUs	KV0161A

19" Rackmounting Kit 1U for Single Unit	RMKT2004
Two Units	RMK2004-2

To link CPUs up to 10 meters away over CATx, order a SAM for each connection...

ServSwitch CX Server Access Modules (SAMs)

PS/2	KV1400A
USB	KV1401A
PS/2 with Audio	KV1402A
USB with Audio	KV1403A
Sun® with Audio	KV1404A
Dual-Access USB	KV1405A
Dual-Access USB with Audio	KV1406A
USB, DisplayPort with Audio	KV1408A
USB, Mini DP with Audio	KV1409A

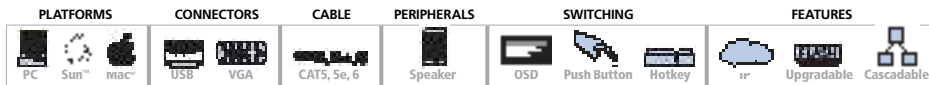
For remote CPU/server access up to 300 meters away over CATx, order...

ServSwitch CX Remote Access Modules

PS/2	KV04-REM
USB	KV04U-REM
PS/2 with Audio	KV04A-REM
USB with Audio	KV04AU-REM
PS/2 with DeSkew and Audio for USB	KV04AS-REM
USB with DeSkew and Audio	KV04AUS-REM

For full features, specs and pricing details, go to www.blackbox.fi

Manage your enterprise network using existing infrastructure and



ServSwitch CX Uno with IP ServSwitch CX Quad IP



KV1081A: top: front; bottom: rear



KV4161A: top: front; bottom: rear

Note:

Compatible with ServSwitch Wizard IP, Wizard IP Plus, CX IP and IP DXS.

One Software Solution to Rule Them All

Wizard.NET

Wizard.NET is a professional enterprise management suite that delivers total IP device control, management, and connectivity. Black Box KVM over IP (KVMoIP) devices provide the ability to control large numbers of host computers from remote locations. When controlling larger groups of dispersed computers using numerous KVMoIP devices, the major challenge becomes one of management—retaining active control over a complex mix of devices, host computers, and registered users. Wizard.NET was developed as a common interface to help you remotely

manage any number of KVMoIP devices together with all of their connected host computers and the access rights of the users.

Wizard.NET is delivered as a software solution only, and operates as a server application running on a system that can be completely separate from any of the KVMoIP devices—it merely requires an IP network or Internet connection. Wizard.NET uses an intuitive HTML user interface, which means that registered users can access and control it remotely using a standard Web browser. Like all Wizard KVMoIP products, Wizard.NET

employs high specification security techniques to ensure that only authorized users may gain access.

Wizard.NET has two main modules, the manager and the connector. The **manager module** is accessible only to managers and administrators. It is where the details about all connected devices, hosts, and users are configured and stored. The **connector module** can be used by registered users to enable quick access to all of the targets for which they have access rights. Targets may be devices, hosts, or device groups as appropriate.

your IP network, securely and remotely.

- IP support enables you to access servers remotely.
- With the CX Uno, connect one local or one IP user to 8 servers over TCP/IP with VNC software.
- With the CX Quad IP, connect up to four IP users, plus one local user, simultaneously.
- Resolutions up to 1920 x 1200 with DDC emulation.
- Supports USB-style keyboard and mouse (PC, Mac®, or Sun®).
- DDC emulation is enhanced by DC balancing to ensure true colors.
- Cascade switches to control even more servers.
- Integrates into Wizard.net.
- **Standard Warranty — 2 Year**
- **Extended Warranty — 1 Year or 3 Years**

The ServSwitch™ CX KVM switches with IP are compatible with all major computer platforms; connect via lightweight, inexpensive twisted-pair cable; and enable you to access servers across any IP network, either a private intranet or the Internet. Whether you choose the CX Uno or CX Quad depends on the number of users you need to give access to simultaneously. The CX Uno connects one local user to up to 16 servers over the IP network. Additionally, you can cascade the CX

Uno units to access up to 256 servers.

The CX Quad IP connects four IP users, plus one local user, to up to 16 servers, with the ability to cascade units up to 128 servers. The CX Uno with IP also enables you to access servers across any IP network using a Java-enabled Web browser or VNC client. Additionally, the CX Quad IP supports 16 serial console connections using the KV1407A server access modules (SAMs).

Additionally, switches support Display Data Channel (DDC) emulation. DDC enables your monitor to communicate with the attached CPUs' video cards and configure the CPUs' video drivers automatically at boot up.

You can set up the ServSwitch CX switches behind the security of your network firewall, and it also has the security features it needs to be safe on its own. These enterprise-grade KVM switches use AES128 bit encryption and RSA2048 authentication, ensuring your control system remains secure at all times. You can also configure eight separate users internally with unique access privileges, all of which are stored only within the switch.

Connect user stations and servers via lightweight and inexpensive CAT5, CAT5e, or CAT6 UTP cable—no bulky KVM cables needed. UTP cable provides more distance than KVM cable to connect the servers. Use SAMs to provide keyboard, video, mouse, and speaker connections. Servers may be placed 9.8 meters from the switch.

The ServSwitch CX switches feature Ecopulse circuitry, which powers down unused circuits when they are not required. Over the life of the switches, this reduction of power saves significant resources.

ServSwitch CX Uno with IP

8-Port	KV1081A
16-Port	KV1161A

ServSwitch CX Quad IP

16-Port	KV4161A
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ServSwitch Server Access Module

Serial	KV1407A
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ServSwitch CX Remote Access Modules

USB	KV04U-REM
USB with Audio	KV04AU-REM
USB with DeSkew and Audio	KV04AUS-REM

To link CPUs up to 10 meters away over CATx, order a SAM for each connection...

ServSwitch CX Server Access Modules (SAMs)

PS/2	KV1400A
USB	KV1401A
PS/2 with Audio	KV1402A
USB with Audio	KV1403A
Sun® with Audio	KV1404A
Dual-Access USB	KV1405A
Dual-Access USB with Audio	KV1406A
USB, DisplayPort with Audio	KV1408A
USB, Mini DP with Audio	KV1409A

For full features, specs and pricing details, go to www.blackbox.fi

By Garrett Swindell

To ensure maximum security, Wizard.NET does not retain any passwords within its database for the devices that it controls. Instead, a valid password is used once only to gain access to each device during the "acquire" stage, when Wizard.NET establishes a Secure Ticket with the device. In all subsequent accesses to each device, the relevant secure ticket is used to gain access.

Wizard.NET works with ServSwitch Wizard IP, Wizard IP Plus, ServSwitch CX IP and Wizard IP DXS.



Wizard.NET log-in screen.

Combine the advantages and benefits of remote access software and extension technology.

By Black Box Media Services

IP Access Technology

IP access technology extends keyboard, video, and mouse (KVM) signals, digital video, digital audio, and USB peripherals from any computer or server over TCP/IP via a local area network (LAN), wide-area network (WAN), or Internet connection. This technology uses existing network infrastructure and supports local and remote users, usually simultaneously. IP access technology works in diverse hardware environments and is ideal for managing multilocation data centers and branch offices.

These capabilities translate into real savings for companies having to deal with the proliferation of servers in many offices, particularly for corporations and government agencies required to deliver 24/7 uptime and real-time access to mission-critical servers every day of the year.

IP access and KVM-over-IP (KVMoIP) solutions combine the advantages of

remote access software with the benefits of switching and extension technology. Like most KVM switches, IP access products don't require any software to be loaded on the host computers. They interface directly with the keyboard, monitor, and mouse connectors of the host computer or KVM switch. Circuitry within the KVMoIP device digitizes the incoming video signal and processes it into digital data that is communicated to a viewer program running on a remote client computer over a LAN/WAN or the public Internet.

By addressing network issues from a remote location, you can simply manage issues from your desk, even save yourself the hassle of traveling to a site in the middle of the night. Use a browser-based connection, even a smartphone or tablet computer or PDA, to reboot or administer a roomful of servers remotely—a real convenience.

IP access solutions that feature virtual media technology take that convenience further. They enable a remote user to effortlessly move files from a mass storage device—a USB flash drive for example—from your location to the computer on which you're working. Cost savings are realized through reduced downtime and less travel. Plus, in some cases, there's no need to replace existing KVM switches with proprietary ones to get a KVMoIP server-control solution.

Black Box IP access solutions enable you to access remote servers at the BIOS level, which is important when you need to troubleshoot from off site, and don't want to dispatch a technician. Install or recover software applications and install OS patches from your location anywhere in the world. Plus, this BIOS-level control is possible regardless of the server's brand or model and even works if the operating system is down.

Free, live, Tech Support.

Can we help you find the right solution or provide you with more in-depth advice?

Talk to an expert:

0201 888 800

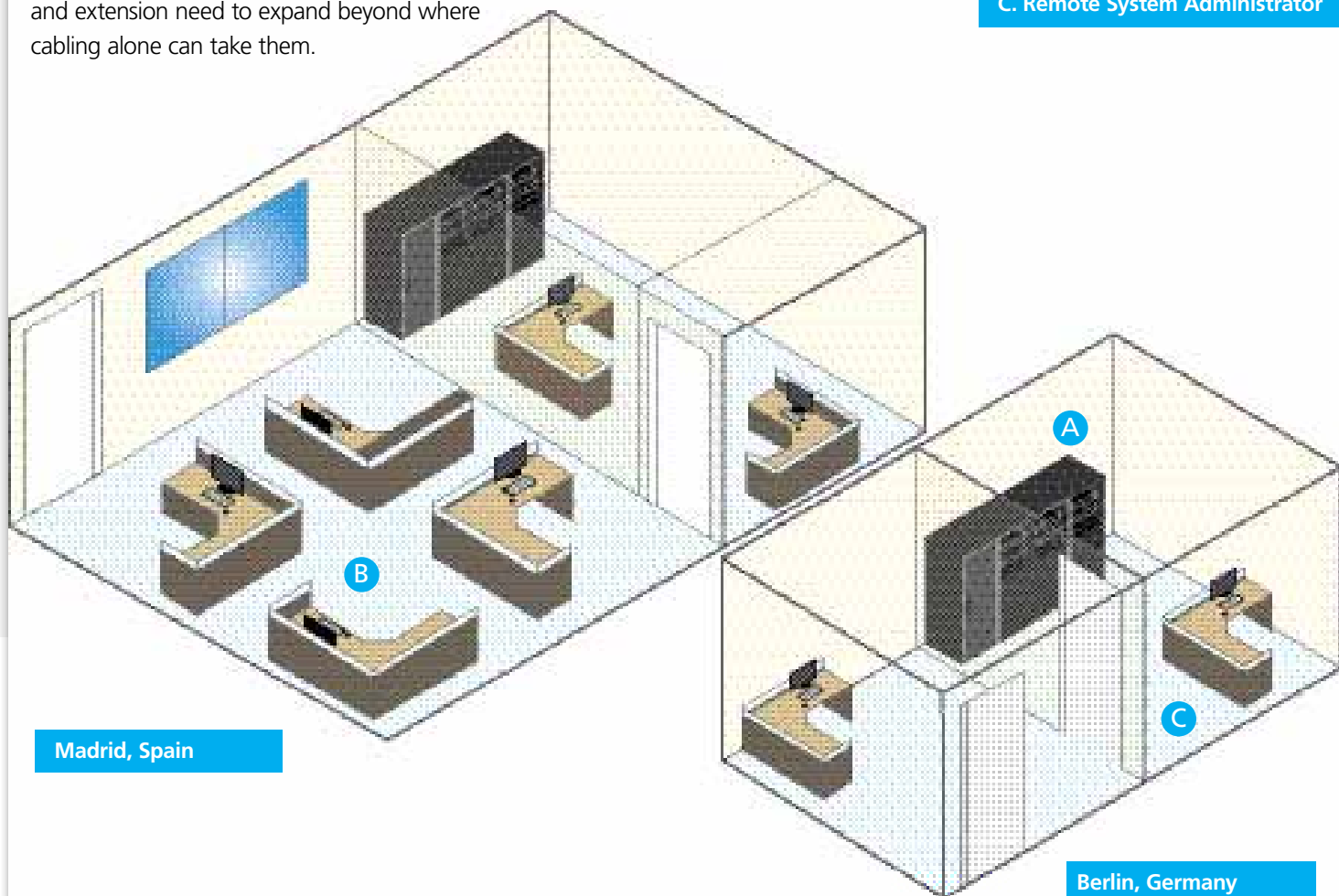
techsupport@blackbox.fi



Multilocation Office

IP access technology takes the office across the continent.

With the steady expansion of the corporate office from one city to national or global enterprises, the technology needed to share information needs to keep up. KVM switching and extension need to expand beyond where cabling alone can take them.



Therefore, IP access technology will continue to evolve, providing companies with state-of-the-art yet cost-effective ways of monitoring and managing.

IP-enabled KVM switches, such as the ServSwitch CX Quad IP (KV4161A), give multiple users in multiple locations simultaneous access to the systems they need to effectively do their work. In a configuration such as shown here, a small office in Berlin (A) can manage a larger office in Madrid. This cost-effective system requires no specialized equipment or software. The IP-enabled switch is connected to servers using CATx cables, and accessed via a local-area network (LAN) or wide-area network (WAN). Users at PCs (B) go to a Web browser, enter their IP-address and related

log-in information, and can instantly see and control remote servers, and can view data stored there. Most switches support multiplatform operating systems. As the organization expands, the number of users can grow simply by daisy chaining switches. The CX Quad IP can enable control of up to 256 servers!

These switches enable local users and a remote user simultaneous access. The system administrator (C) manages the servers via remote access IP technology.

Ideal in small and medium data centers for up to four users, with easy connections made over CATx cable.



ServSwitch CX

- Maximum resolution of 1900 x 1200.
- Ideal for small and mid-size data centers.
- Reset one or more host system power switches via the switch's power control port.
- Supports PS/2 or USB style keyboard and mouse.
- Includes rackmounting hardware.
- Integrates into Wizard.net.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



KV0416A-R2

Easier connections than ever!

The ServSwitch™ CX enables up to four users to connect to the switch via CAT5, CAT5e, or CAT6 UTP cable—no bulky KVM cables to deal with.

In addition, you can mix and match different kinds of servers on the same CX switch. Just run CATx cables from the switch's server ports to the Server Access Modules (SAMs) that connect to your servers. Simply choose the appropriate SAM for each server.

What's more, you can connect the ServSwitch CX to either a PS/2 or USB keyboard and mouse—it includes both connector types.

Simple server selection.

Whether you're working at a user station or the local analog console port in the server room, you can select a server to access and control via on-screen menus or hotkeys. On-screen menus make server selection simple because you can give each server a name that makes sense to you.

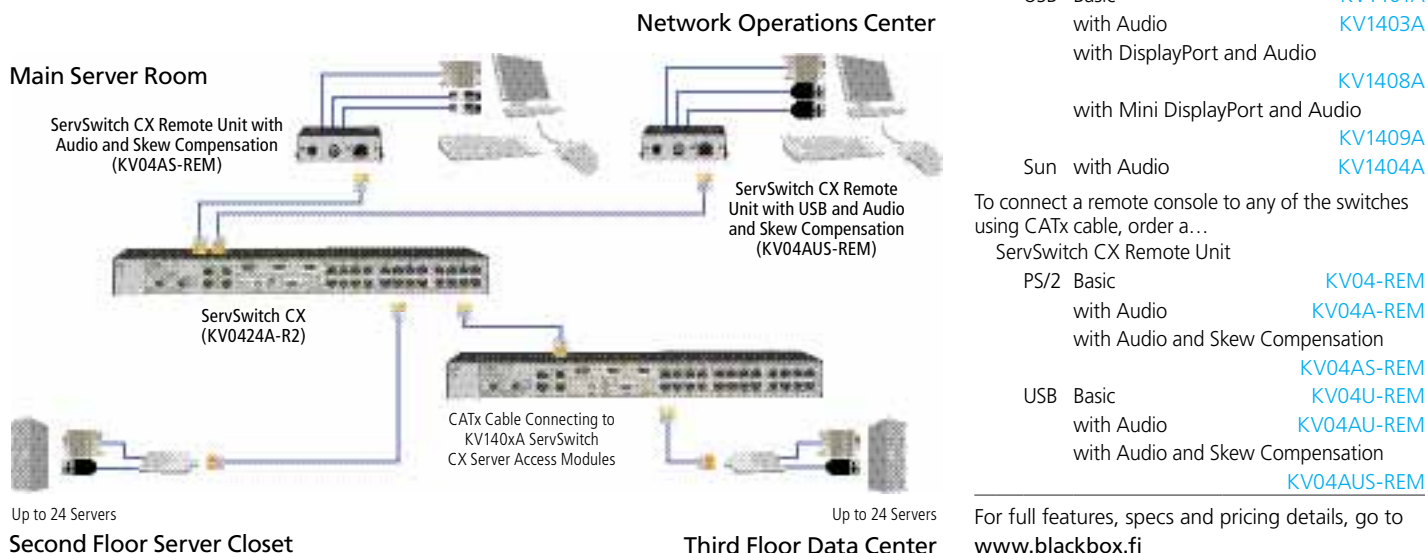
Sight and sound support.

The ServSwitch CX provides super-sharp resolutions up to 1900 x 1200 for all users up to 50 meters away. At maximum distance we recommend to use no more than 1280 x 1024.

By choosing a SAM with audio, you add support for stereo speakers, enabling you to hear audible alerts.

Add remote management over IP.

For even greater versatility, you can cascade this switch with its IP-enabled version, the ServSwitch CX with IP (KV1416A-R2, KV1424A-R2). This gives you remote server management over the IP network.



Remote IP connectivity over CATx cable for one local user for enterprise management.



ServSwitch CX with IP



New SAMs!
DisplayPort
and Mini
DisplayPort

- IP support enables you to access servers remotely.
- Connect one local user, one IP user, and up to two remote users—simultaneously.
- Simplify cabling with CAT5, CAT5e, or CAT6 UTP cable.
- Supports PC, Macintosh®, and Sun™.
- Connect PS/2 or USB keyboards and mice.
- Cascade switches to control up to 128 servers.
- Support for DisplayPort and Mini DisplayPort with use of SAMs.
- Integrates into Wizard.net.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

The ServSwitch™ CX with IP helps manage your enterprise network. Access and switch remotely between servers over a private intranet or over the Internet.

The ServSwitch CX with IP can be installed behind your network firewall; it also has the robust security features it needs to be safe on its own. Sophisticated 128-bit public/private key protection locks the switch tight. Two-tier password protection—administrative and non-administrative—adds another layer of security.

Connect user stations and servers via lightweight and inexpensive CATx UTP cable, which provides more distance than KVM cable—you can connect two user stations up to 300 meters from the switch. At the server end, a SAM provides keyboard, video, mouse, and speaker connections. Servers may be placed up to 50 meters from the switch.

ServSwitch CX with IP, (1) Local Console Port + (2) Remote CATx User Ports + (1) IP User Port + (1) Modem Port

(16) Servers	KV1416A-R2
(24) Servers	KV1424A-R2

For each server connection, you need...

ServSwitch CX Server Access Modules

PS/2 Basic	KV1400A
with Audio	KV1402A
USB Basic	KV1401A
with Audio	KV1403A
with DisplayPort and Audio	KV1408A
with Mini DisplayPort and Audio	KV1409A
Dual Access	KV1405A
Dual Access with Audio	KV1406A
Sun with Audio	KV1404A

To connect a remote console to any of the switches using CATx cable, order...

ServSwitch CX Remote Units

PS/2 Basic	KV04-REM
with Audio	KV04A-REM
with Audio and Skew Compensation	KV04AS-REM
USB	KV04U-REM
with Audio	KV04AU-REM
with Audio and Skew Compensation	KV04AUS-REM

For full features, specs and pricing details, go to www.blackbox.fi

QUESTIONS to ask.

1. How many users to how many computers? What kind of connectors (PS/2, USB, DVI)?

In order to get the right KVM switch, you need to know how many ports the switch should have and what kind of devices it's going to be connected to. When viewing KVM devices, think about how your switching needs will grow. If specialized HIDs are required, you need the right emulation. Do you need to switch audio, serial, microphone?

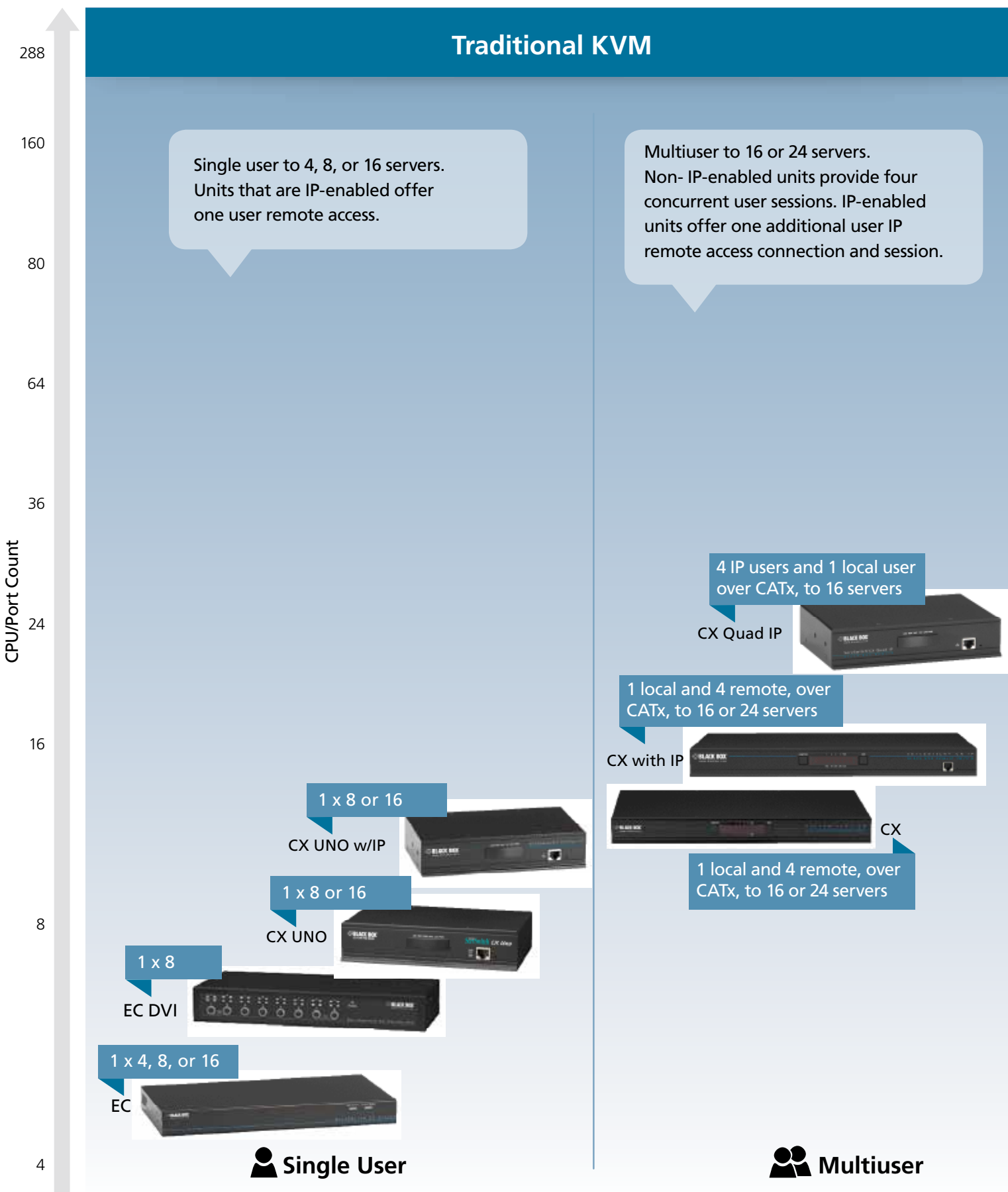
2. What kind of cabling, CATx (also called proprietary or native cabling) or fiber optic (single- or multimode)?

Think about the distance requirements for your KVM switches. For shorter distances, CATx cabling is usually sufficient. But for remote management, or extension over long distances, fiber optic cabling is better.

3. Do you want to manage switches remotely using an IP network?

The best option for remote management and high-end video extension is to use your organization's IP network.

Contact the experts at 0201 888 888.



IP-Based Matrix Switching

Digital Media Extension and Matrix Switching over an IP network.

Agility



DTX



InvisaPC



InvisaPC—Virtual desktop infrastructure over an IP network.



IP-Based

High-Performance Matrix Switching

DKM FX



DKM FXC



N x N HD Video and Peripheral Matrix Switching Systems.

DKM FXC has fixed configurations for CATx and/or Fiber extensions.

DKM FX supports modular configurations for CATx, fiber, or a combination and a higher degree of redundancy.



Direct Connect CATx or Fiber





Desktop KVM Switching

Green Spaces

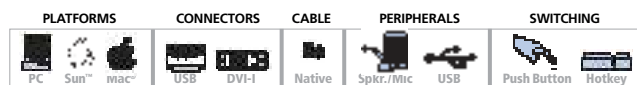
Through the use of desktop KVM switches, even small offices can benefit from the cost and energy savings that KVM switching brings to the table.

Desktop KVM switches enable you to:

- Manage computers from just one keyboard, monitor, and mouse.
- Save on the cost of purchasing, maintaining, and operating multiple video displays.
- Reduce office clutter, energy cost, and waste.
- Improve productivity by using several CPUs for multiple projects at once.
- Avoid making compromises on video and audio quality.
- Easily install plug-and-play switches, with no need to install software.



Use a single workstation to connect up to four PCs with this entry-level switch for high-quality DVI-D video.



ServSwitch DT DVI with USB

- Switch up to four PCs.
- Supports resolutions up to 1920 x 1200 at 60 Hz.
- DDC EDID support via emulation.
- USB 2.0 transparent version supports peripherals via a built-in hub.
- Ideal for entry-level or mission-critical applications.
- Hotkey switching.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



KV9612A: top: front view;
bottom: rear view

These two- or four-port USB KVM switches enable you to access up to four CPUs with high-resolution DVI video connectors from a single workstation. Set up desktop KVM switching with high-quality DVI-D video. These switches enable multilayered switching, so you can easily set up independent peripheral switching or collectively switch them all to a single target in one step.

The ServSwitch DT DVI Series supports full DVI at resolutions up to 1920 x 1200 at 60 Hz. You can fine tune the signals, depending on signal strength.

Switch DVI-D and audio signals with transparent USB 2.0 signals via push buttons. A built-in hub supports up to four USB peripherals.

For easy hotkey switching, the KV9614A is the right choice. It supports USB keyboard and mouse devices only.

Emulation means unselected computers continue to see the identities of the keyboard and mouse, which means that no enumeration is necessary when their link becomes active once again. This not only helps to make reconnecting faster, it also increases switching reliability.

This is important because USB links are at their most vulnerable during the switching process.

The 2-port model with emulated USB keyboard and mouse (KV9612A) supports DVI-D only. The 4-port models support DVI-I.

Both models support stereo audio signal switching for speakers and microphones. Audio channels can be switched independently from USB and video.

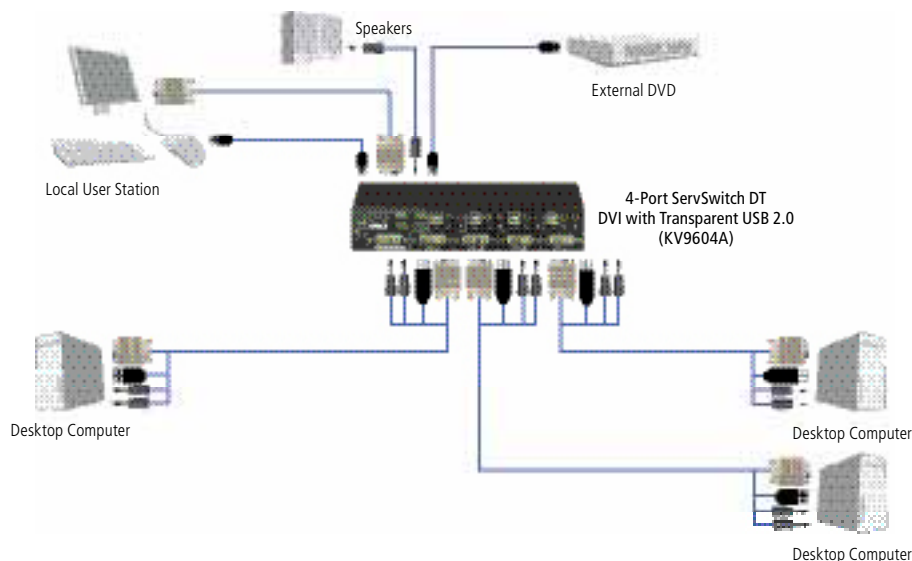
ServSwitch DT DVI

with Transparent USB 2.0	
4-Port	KV9604A
with Emulated USB Keyboard/Mouse	
2-Port	KV9612A
4-Port	KV9614A

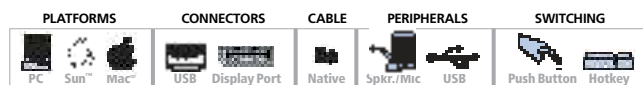
ServSwitch DT Series CPU Cables	
3.0-m	EHN900024U-0010
4.5-m	EHN900024U-0015

Audio Cables	
1.5-m	EJ110-0005
3.0-m	EJ110-0010

For full features, specs and pricing details, go to www.blackbox.fi



Entry-level switching support for DisplayPort video with a small footprint for desktop applications.



ServSwitch DT DisplayPort Switches

- Support DisplayPort with high resolution video up to UXGA (1600 x 1200), full HD (1920 x 1080), and WUXA (1920 x 1200), and WQXGA (2560 x 1600).
- Switching system enables the USB or audio devices to operate independently.
- Support keyboard and mouse plug-and-play.
- No software required.
- **Standard Warranty — 1 Year**
- **Extended Warranty — 1 Year or 3 Years**

The ServSwitch DT DisplayPort Switches support one of the highest video resolution standards around, plus multilayered switching. Switch peripherals collectively or independently, depending on whether you want to do parallel tasks on different machines, or target a single computer with multiple peripherals. Switching is controlled by front-panel buttons or hotkeys.

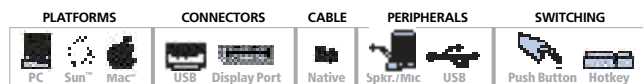


ServSwitch DT DisplayPort Switches with USB and Audio

2-Port	KV9702A
4-Port	KV9704A

For full features, specs and pricing details, go to www.blackbox.fi

Compact unit with multilayered switching for DisplayPort, audio, and USB peripherals.



ServSwitch Wizard DP USB DisplayPort



This compact unit enables a single operator to control up to four computer systems and share peripherals between them. Switch KVM signals, audio, and two USB devices in unison or independently between all the connected systems.

Additionally, the user can mix peripherals between the systems. For instance, you can write an e-mail on one system, listen to music on another, print documents from a third, and use yet another USB peripheral on the fourth.

True USB emulation switching ensures that the full characteristics of the connected keyboard and mouse are distributed to every system. Earlier USB KVM switches relied upon a standard keyboard and mouse template to tell each computer system how to deal with the connected peripherals. With this switch, the "real" profiles are presented to every connected system, so specialized keyboards and mice are fully supported.



For mission critical 24/7 applications

- Supports DisplayPort 1.1 compliant, four lanes at 2.7 Gbit/s.
- Supports the DisplayPort video standard, with high resolution video up to UXGA (1600 x 1200), full HD (1920 x 1080), and WUXA (1920 x 1200), and WQXGA (2560 x 1600).
- Also supports audio and USB switching independently or in unison to other connected devices.
- **Standard Warranty — 2 Years**
- **Extended Warranty — 1 Year or 3 Years**

ServSwitch Wizard DP USB DisplayPort

4-Port	KV9804A
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For full features, specs and pricing details, go to www.blackbox.fi

Access, control, boot, and reboot multiple dual-head computers using one USB keyboard, monitor, and mouse.



ServSwitch DT Dual-Head DVI USB ServSwitch DT DVI with Bidirectional Audio

- Two-, four-, or eight-port KVM switches provide control of up to eight dual-head and USB-enabled multimedia computers.
- Support digital resolutions up to an impressive 1920 x 1200.
- KV9624A sends VGA analog video, supporting resolutions of 2048 x 1536.
- USB 2.0 device hub ports for high-speed USB device sharing.
- Multilayered switching.
- Support DDC2B emulation.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



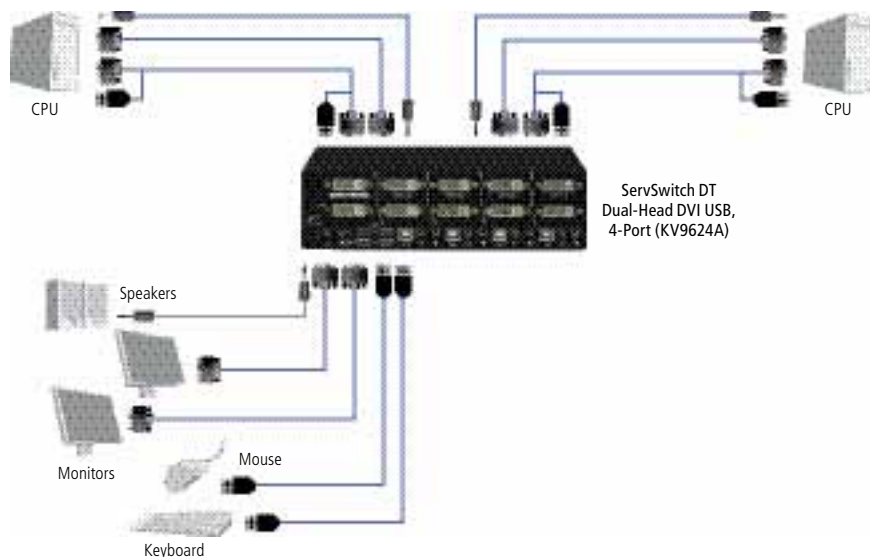
These ServSwitch™ DT DVI KVM switches enable you to control up to eight multimedia computers. The switches support digital resolutions up to 1920 x 1200 for sharp video plus stereo audio. The 4-port Dual-Head switch (KV9624A) also supports analog video resolutions up to 2048 x 1536.

In addition to multimedia capabilities, the Dual-Head DVI USB KVM switches feature four USB ports. The device hub port supports USB 1.1 or 2.0 high-speed device sharing. The switches are truly plug-and-play with DDC2B emulation.

The ServSwitch DT DVI with Bidirectional Audio also enables USB device sharing, and the bidirectional audio is integrated into the

USB interface. This switch is compatible with digital-only flat screens.

All of these KVM switches support multilayered switching, a technology that enables either independent switching or collective switching of the peripherals. With independent switching, you can achieve multiple tasks in parallel. Collective switching enables control of a single target computer.



ServSwitch DT Dual-Head DVI USB

2-Port DVI-D	KV9622A
4-Port DVI-I	KV9624A
8-Port DVI-I	KV9628A

ServSwitch DT DVI with Bidirectional Audio

4-Port	KV9634A
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ServSwitch DT Series CPU Cables

1.8-m	EHN900024U-0006
3.0-m	EHN900024U-0010
4.5-m	EHN900024U-0015

DVI-D Male to DVI-D Male Cables

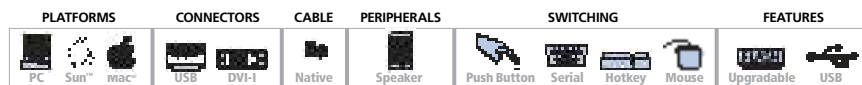
1.8-m	EVNDVI02-0006
3.0-m	EVNDVI02-0010
4.5-m	EVNDVI01-0015

Audio Cables

1.5-m	EJ110-0005
3.0-m	EJ110-0010

For full features, specs and pricing details, go to www.blackbox.fi

High-end DVI KVM switching for single or multiple dual-, tri-, or quad-head computers and USB devices.



ServSwitch Wizard DVI Multi with True USB Emulation



- A flexible, professional-grade KVM switch for high-performance, multihead KVM switching.
- Enables a single user to control four computers fitted with dual-head, tri-head, or quad-head video and share USB peripherals between them.
- Supports access to two, three, or four video heads on each channel. Switch DVI video, keyboard, and mouse streams to multiple CPUs.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

Intelligent options port.

This highly flexible KVM switch centralizes and simplifies high-end, multihead video switching access at a single user console with multiple DVI screens.

Plus, with advanced support for multiple high-speed USB devices, the ServSwitch Wizard DVI Multi with True USB Emulation serves today's busy multitaskers quite well.

It's ideal for IT administrators and medical imaging, graphic design, and broadcast studio professionals who not only require quick, reliable access to multiple computer CPUs and multiple video channels, but also need simultaneous access to a mix of USB peripherals.

Multihead video channel access—simplified.

The ServSwitch Wizard DVI Multi enables a single KVM workstation user to control four

separate computer systems or servers and flexibly share peripherals among them.

In addition to multihead DVI-I video KVM user console inputs for multiscreen workstations, the switch features dual, triple, or quad DVI-I video connectors on each of its four computer channels. This way, you have easy access to two, three, or four video heads on each channel.

Each video head channel on this high-quality switch supports dual-link digital DVI video at up to 450 megapixels per second. Plus, it supports high resolutions, whether you need 2048 x 1080 video for post-production type work or 2560 x 1600 (WQXGA) image clarity for very detailed medical or R&D lab imaging.

Multicomputer and multiperipheral access.

This high-performance, multimedia switching platform offers more than just straight switching between four multihead computer systems. You can also use a KVM console to work on one computer while your favorite USB devices remain connected to other computers, all easily accessible to you. And because the ServSwitch Wizard DVI Multi supports audio connectivity, you can connect speakers to yet another computer (audio can be switched independently from USB and video).

The ServSwitch Wizard Multi DVI's rear panel has two USB Type A ports as part of its KVM user console connections plus separate switched USB Type A ports for additional USB 2.0 connectivity. You can reassign any of the connected USB peripherals to any of the connected computers

quickly. Attached devices can either be switched in unison, or you can mix peripherals between any of the systems.

The switch supports a wide range of USB devices, especially high-speed USB 2.0 peripherals on its switched USB ports. Printers, scanners, and non-standard HID devices can all be attached. For instance, you can be creating e-mails on one system, listening to audio on a second one, printing from a third computer, and scanning documents on a flash drive—all at the same time.

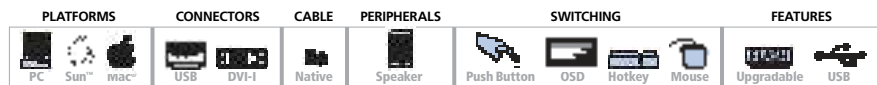
For dual-link, single-link, or a VGA option, you can also check out the ServSwitch Dual-Link USB KVM switch. This four-port switch offers high resolution DVI-I or VGA, and also supports true USB emulation.

ServSwitch Wizard DVI Multihead Switches with True USB Emulation

Single-Head	KV2004A
Dual-Head	KV2204A
Tri-Head	KV2304A
Quad-Head	KV2404A

For full features, specs and pricing details, go to www.blackbox.fi

High-end VGA KVM switching for Single- and Multi-head computers and USB devices.



ServSwitch Wizard VGA, USB KVM Switches

- Flexible, professional-grade KVM switches for high-performance switching.
- Enable a single user to control four computers and share USB peripherals between them.
- Switch VGA video, keyboard, and mouse streams to multiple CPUs.
- Support high resolutions up to 1920 x 1200 (WQXGA).
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

These highly flexible KVM switches are ideal for IT administrators and medical imaging, graphic design, and broadcast studio professionals who not only require quick, reliable access to multiple computer CPUs and multiple video channels, but also need simultaneous access to a mix of USB peripherals.

With advanced support for multiple high-speed USB devices, the ServSwitch Wizard VGA, USB serves today's busy multitaskers quite well. ServSwitch Wizard VGA supports a wide range of USB devices, especially high-speed USB 2.0 peripherals on its switched USB ports. Printers, scanners, and non-standard HID devices can all

be attached. For instance, you can create e-mails on one system, listen to audio on a second one, print from a third computer, and scan documents on a Flash drive—all at the same time.

The switch is available in models with single, dual, triple, or quad VGA video connectors on each of its four computer channels, providing you with easy access to one, two, three, or four video heads on each channel.

Each video head channel on this high-quality switch supports VGA video at resolutions of 1920 x 1200 video for post-production type work or 1920 x 1200 image clarity for very

detailed medical or R&D lab imaging.

Each computer channel on the ServSwitch Wizard VGA has USB Type B and 3.5-mm audio jack inputs.



KV3404A

ServSwitch Wizard VGA, USB

Single-Head Video	KV3004A
Dual-Head Video	KV3204A
Tri-Head Video	KV3304A
Quad-Head Video	KV3404A

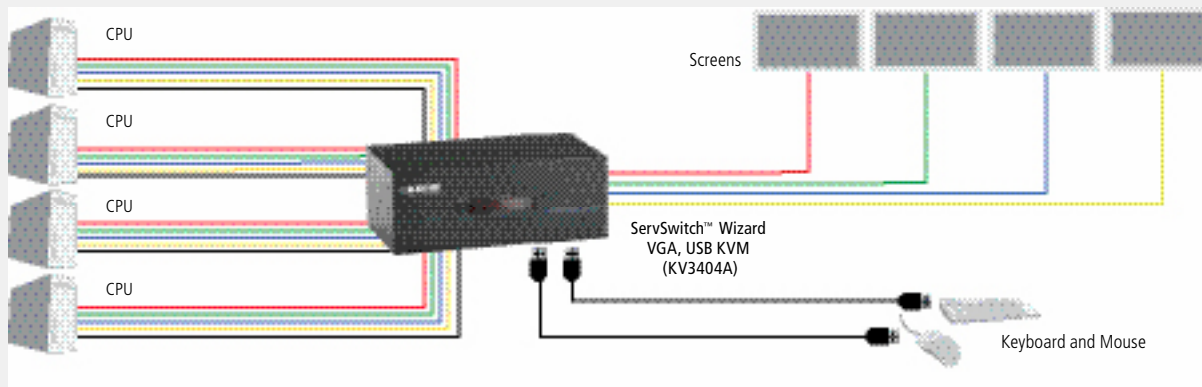
For full features, specs and pricing details, go to www.blackbox.fi

Typical application

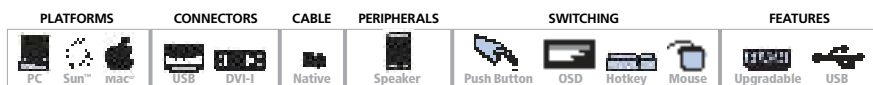
Test facility for traffic control systems where workstations are outputting 4 x VGA plus USB.

The operator/test engineer can easily select from any of the attached workstations by sharing the peripherals doing his testing in a space saving environment.

In some applications even two of the Wizard Multihead switches are switched in synchrony via the units options port to support 8 video heads per server (railway systems testing).



Share high-end video and any four USB peripherals between eight workstations.



ServSwitch Wizard DVI Dual-Link, USB

- Supports resolutions up to 2560 x 1600 at 60 Hz.
- True DDC EDID support and management.
- Up to eight PCs can be switched via an on-screen display (OSD), hotkey, mouse, or RS-232/V.24.
- Supports dual-link DVI-D, single-link DVI-D, and VGA.
- Stereo audio and USB 2.0 switch independently from the video signal.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

ServSwitch Wizard™ DVI Dual-Link, USB, 8-Port KVM switch features True USB Emulation technology, which ensures that the full characteristics of the connected USB peripherals—including keyboards and mice—are passed to every system concurrently, so specialized features are quickly recognized on the attached devices. What's more, each computer retains this information, even if the device is plugged into another computer. Because of this technology, the switch avoids many of the limitations found in traditional emulations, enabling instantaneous switching and hotkey support.

You can switch up to eight PCs via OSD, hotkeys, mouse, or RS-232/V.24. The switch provides resolutions up to 2560 x 1600 Hz at 60 Hz. Plus, it supports dual-link DVI-D and single-link DVI-D.

Intelligent options port.

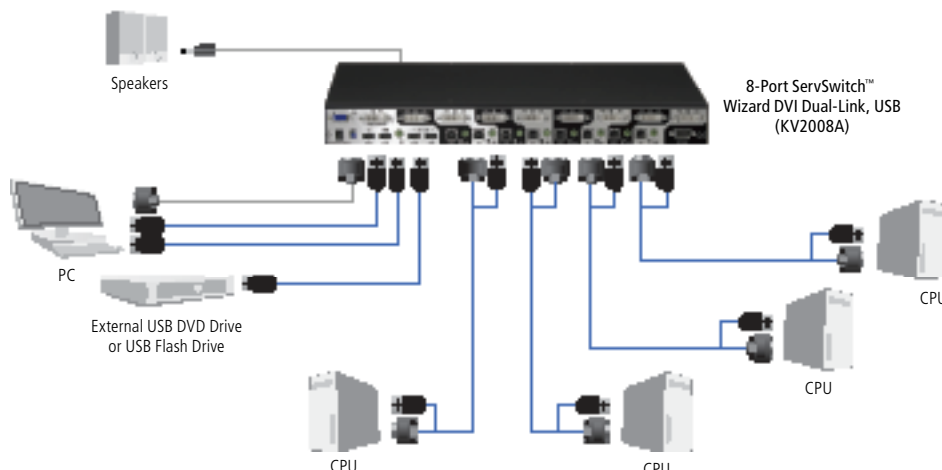
Flash upgrade the Wizard DVI Dual-Link, USB via its intelligent options port. You can also switch it via simple RS-232 protocol or even dry contacts. When linked with another ServSwitch Wizard, the options port can be used for synchronous switching of multiple video heads.

USB 2.0 transparency.

A clever architecture combines transparent USB 2.0 protocol with emulated keyboard and mouse control. To support this, there are two dedicated keyboard/mouse ports on the switch's console port plus two USB 2.0 transparent ports for any USB 2.0 peripherals.



KV2008A (top: front; bottom: rear)



Technical Specifications

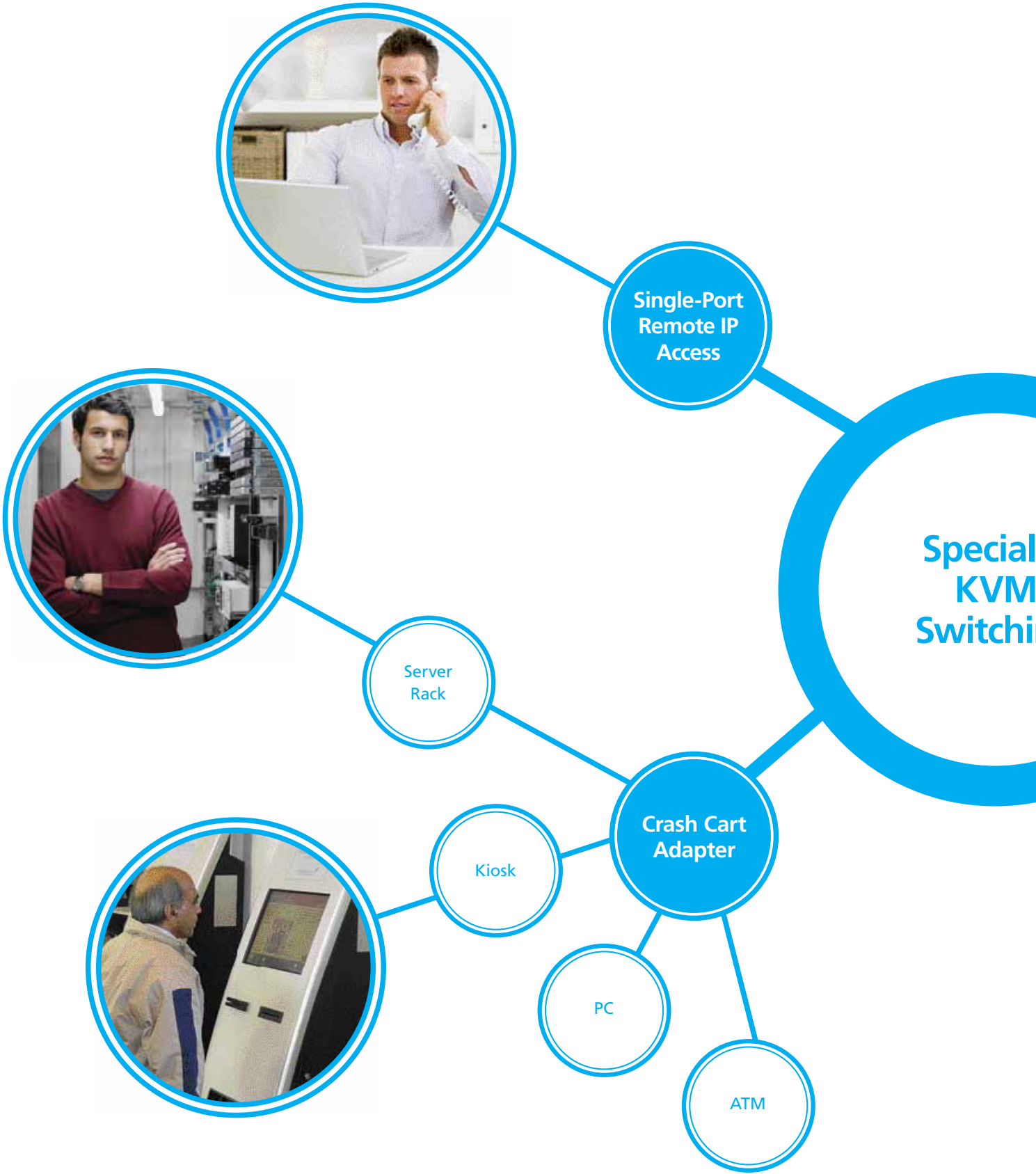
Approvals	CE, RoHS
Connectors	(1) barrel jack (Power); (9) DVI-I F; (1) VGA HD15 F; (8) USB Type B F; (8) 3.5-mm audio jacks; (4) USB Type A F; (1) DB9 M options port
Video	DVI dual-link: 2560 x 1600 @ 60 Hz; DVI single-link: 1920 x 1200 @ 60 Hz; VGA: 1920 x 1200 @ 60 Hz
Wiring	T568A or T568B, 22 to 26 AWG, solid or stranded
Power	External: 100–240 VAC/5 VDC 6A
Dimensions	4.4 x 48.3 x 22 cm (hwxwd)
Weight	2.5 kg

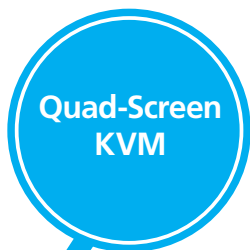
* NOTE: Wizard DVI Dual-Link does not convert video formats.

ServSwitch Wizard DVI Dual-Link, USB*

8-Port	KV2008A
Spare Power Supply	PS650
ServSwitch CPU Cables	
1.8-m	EHN900024U-0006
3.0-m	EHN900024U-0010
4.5-m	EHN900024U-0015
DVI-I M to VGA (HD15 F) Adapter	FA461
DVI-I F to VGA (HD15 M) Adapter	FA462
3.5-mm Stereo Audio Cable	
3-m	EJ110-0010

For full features, specs and pricing details, go to www.blackbox.fi





Specialty Switching

We Do More Than Desktop

Beyond two- and four-port CPU sharing, there's a whole realm of unique technology from experts in connectivity. We research and develop specialty switches for very specific applications, such as:

- Keyboard and mouse switching with glide-and-switch technology for multiple monitors, ideal for finance and 1-1-2 call centers.
- Secure switching with hard-wired ports to prevent data leaks within the box as well as protect against electronic snooping, targeted to the unique needs of the military.
- Image processing with HDCP to support streaming video, perfect for conference rooms and monitoring centers.

We rigorously test the capabilities of all our switches so that we can pass on the best of the best to you.



TEMPEST and Common Criteria

By Dawn Patton Mangine

Security at Every Step

Common Criteria Evaluation Assurance to Level 2+

Common Criteria defines a common set of tests regarding the process of the design, testing, verification, and shipping of new security products. This protection profile is an international standardized process for information technology security evaluation, validation, and certification.

The ServSwitch Secure Switches with USB and DVI or VGA are evaluated to most current protection profile requiring Common Criteria Evaluation Assurance to Level 2+ (EAL2+). The Common Criteria scheme is supported by the National Security Agency through the National Information Assurance Program (NIAP).

TEMPEST-Secure KVM Switches

TEMPEST testing, while classified, is regarded as a process that assesses the port-to-port isolation required for certain KVM switches. A TEMPEST approval means the necessary isolation is achieved and qualified. Additionally, the threat of data linking by various covert electromagnetic eavesdropping mechanisms has been evaluated and found to be secure.

The TEMPEST designation is often required by military organizations. TEMPEST, as a security standard, pertains to technical security countermeasures, standards, and instrumentation that prevent or minimize the exploitation of vulnerable data communications equipment by technical surveillance or eavesdropping.

For 2 or 4 ports, with USB and DVI-I or VGA, the ServSwitch™ Secure KVM Switches with USB provide control and separation of up to four PCs connected to secure and non-secure networks through just one keyboard, monitor, and mouse.

- High port-to-port electrical isolation, which facilitates data separation (RED/BLACK). Channel-to-channel –80-dB to –60-dB crosstalk isolation protects against

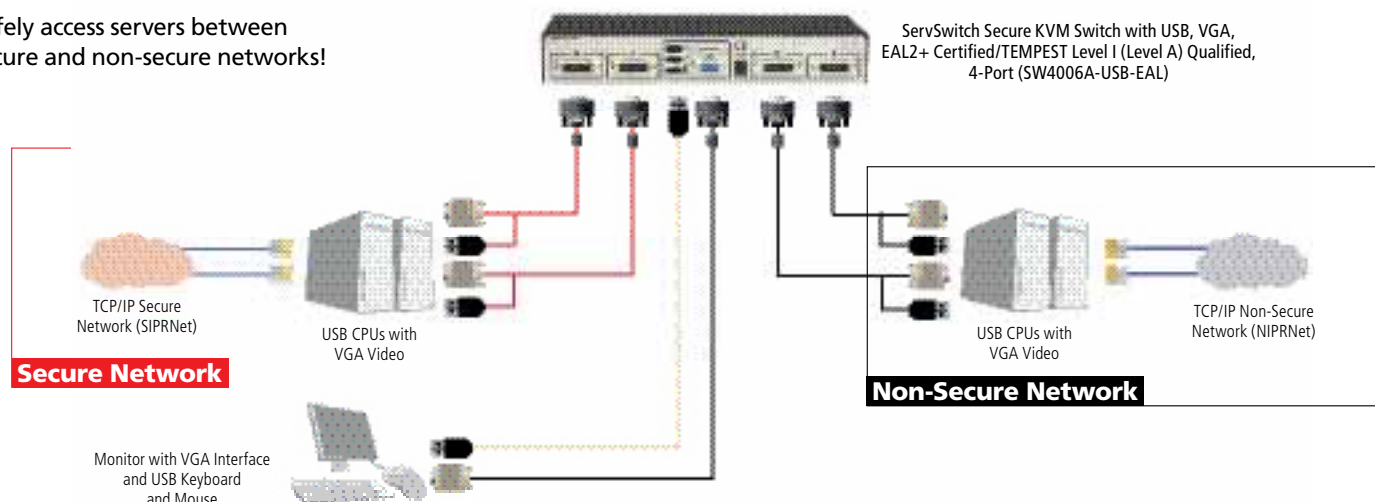


channel-to-channel crosstalk, and software tools and applications cannot be used to access any connected computer from another connected computer.

- Switches are permanently hard wired, preventing access from one CPU to the others or access from one network to others.
- External tamper-evident seals make it easy to spot attempted tampering.
- Users can safely switch among as many as four computers operating at different classification levels.
- Unidirectional flow of keyboard and mouse data means the computer cannot leak data along K/M signaling channels.
- USB host controller erases entire RAM at each channel switchover. This prevents residual data from remaining in the channel after a channel change and being transferred to another computer.
- Only keyboard and mouse devices can be enumerated at the keyboard and mouse ports. Any other USB peripheral connected will be inhibited from operating, preventing the upload or download of unauthorized data.

The ServSwitch Secure Switches with USB surpass the security profiles of most other KVM switches because they have received approvals and certifications in both testing standards.

Safely access servers between secure and non-secure networks!



Military

The Challenge:

As the need for security has grown, Black Box has made it a priority to address the concerns of customers for whom security is the first priority. Whether it's biometric products or remote monitoring equipment, we have striven to stay at the forefront of secure product development.

Some of our biggest customers have been military and governmental security officers who have brought their needs to our attention. (Due to the confidential nature of their posts, we are unable to identify them by name.) In the realm of KVM switching, developing a truly secure switch has been Black Box's goal for some time now. With the line of ServSwitch™ Secure KVM Switches with USB, we are finally able to bring to the market products that meet and exceed security needs at the local, state, and federal levels.

The Solution:

The KVM switching technology concerns of the security market are fairly straightforward. They are looking for USB keyboard and mouse support, USB CAC reader support, digital video support, and TEMPEST and Common Criteria Evaluation Assurance (EAL) certification. Switches that have been previously available either do not meet the correct security criteria or do not perform well enough to attach to mission critical equipment.

Most of the available technology in the market was security-tested based on what was commercially available. Exceptions had been made both on security accreditation and overall quality. Black Box has engineered KVM switches specifically for this market. They pass all security criteria testing and are of high quality.

According to one of our customers who is familiar with security issues, Black Box switches provide the highest level of isolation available in a desktop switch. Some of his switches are a few years old, and others he has had to retire due only

to the fact that the computer technology has developed (into USB and DVI capabilities, for example). Fortunately, Black Box has been able to develop secure switches with DVI capabilities for this client.

His current dependence on the previous line of ServSwitch Secure products is being augmented with a switch that includes a port for a common access card (CAC) reader—the SWx009A-USB-EAL series, with USB and VGA. These two- and four-port switches have undergone TEMPEST and EAL2+ testing to make them the most secure switches available.

TEMPEST is vital for areas where physical security is either not possible or limited. Electronic eavesdropping is a huge problem when dealing with sensitive data and user credentials. By replicating common attack methods, security personnel have found them to be effective for gaining sensitive information.

When equipment is on a vehicle or deployed in an active zone, use of



Security officers know that Black Box is the place to turn to meet their secure switching needs.

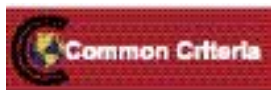
TEMPEST-rated equipment is a must when sensitive data is involved. It can be a user's only line of protection. This design is used primarily to protect data between various security levels of networks. EAL2+ is typically used in environments where multiple physical security layers are already in place.

In military and government IT setups, the most common segregation between secure and non-secure networks is RED/BLACK: the separation between non-classified Internet protocol router networks (NIPRNet) and secret Internet protocol router networks (SIPRNet). This level of segregation applies to anyone who has secret security clearance and also works on the public Internet. He or she would be working on two computers with different network credentials. A security officer's concern would be that data signals are present as crosstalk and can be recovered on the non-secure workstation, thereby violating security barriers. Black Box secure switches prevent this.

Superior security, data isolation, and protection for government agencies.



ServSwitch Secure KVM Switches with USB



- High port-to-port electrical isolation, which facilitates data separation (RED/BLACK). Channel-to-channel -80-dB to -60-dB crosstalk isolation provides robust isolation between networks, so they're ideal for government applications that access classified networks in addition to public networks such as the Internet.
- The low radiated emissions profile protects against electronic snooping.
- Switches are permanently hard wired, preventing access from one CPU or network to the others.
- External tamper-evident seals.
- Support DVI-I video, which is DC balanced and may be encoded for security.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

Threats/Solutions

1. Prevent data leaking between ports and to the outside world.

Threat: Microprocessor malfunction or unanticipated software bugs cause data to flow between ports.

Solution: Unidirectional keyboard and mouse data flow is enforced by hardware "data diodes" so data isolation doesn't rely on software integrity. This makes it impossible for the computer to send data along the keyboard and mouse signaling channel. This advanced design also ensures data isolation through hardware and prevents the keyboard and mouse interfaces from becoming covert computer-to-computer signaling channels because of software holes or unanticipated bugs.

In addition, keyboard and mouse devices can only be enumerated at the keyboard and mouse ports. Any other USB peripherals, such as a USB thumb drive, will be inhibited from operating, preventing any uploading or downloading of data.

Threat: Physical proximity between ports enables data leakage.

Solution: Isolation is improved by placing the red and black ports at the opposite edges of the switch.

Threat: Accidental port switching.

Solution: Locked-down operation disables all keyboard hotkey and mouse switching functions in both software and hardware so that data corruption can't inadvertently cause an unanticipated channel change. The only way to change the channels is with the front-panel keys. There is only one button per channel, so channel selection is clear. Color-coded visual feedback confirms the channel selection.

Threat: Signaling by shorting the power supply or loading the power.

Solution: Each port is independently powered by its USB port. Shorting the power supply on one port will not cause the power on the other ports to be switched off. The shared keyboard, mouse, and monitor circuitry are

powered by the power supply. The lack of a common power supply minimizes electronic signaling.

Threat: Detection of signals on one computer by monitoring for crosstalk (leakage) signals on another computer.

Solution: Minimum crosstalk separation of 60 dB provided between signals from one computer and input or I/O signals to another. There are no connections to sensitive analog inputs, such as computer microphone ports. Microphone circuitry enables sensitive recording of small analog signals. Even very low crosstalk levels could be recorded and act as a means by which a non-selected computer could read data being sent to another computer.

Threat: Timing analysis attacks (looking at what happens on one port to determine data flow patterns on another).

Solution: Only one computer is connected at a time to any shared circuitry. Links are unidirectional, preventing timing analysis.

The ServSwitch Secure KVM Switches come with a range of important security features, making them ideal in military and government applications. Altogether, they surpass the security profiles of competitors' KVM switches. Black Box switches are TEMPEST approved (except SW2008A-USB-EAL and SW4008-USB-EAL), and most of them exceed EAL2+ certification requirements.

Common Criteria is an international standardized process for information technology security evaluation, validation, and certification. The Common Criteria scheme is supported by the National Security Agency through the National Information Assurance Program (NIAP).

The ServSwitch Secure KVM Switches with USB provide control and separation of up to four PCs connected to secure and non-secure networks through just one keyboard, monitor, and mouse. Users can safely switch among as many as four computers operating at different classification levels without worry.

Threat: Electromagnetic emissions.

Solution: Special low emissions cables are used to minimize radiated electromagnetic signal leakage. Filtered power connections minimize emissions down the power lines.

2. Prevent data from being stored in the device.

Threat: Data transfer by means of common storage or common RAM.

Solution: Shared circuitry and the keyboard and mouse are powered down at each channel change to clear all volatile memory of any previous connections. This erases the entire RAM, preventing residual data from remaining in the channel and being transferred to another computer. In addition, the USB host controller and the shared USB peripherals are also powered down, reset, and re-enumerated. This ensures no residual data transfer.

ServSwitch Secure KVM Switches with USB, VGA, and Card Reader Support.

All the benefits of the ServSwitch Secure plus support for a CAC.

These switches offer all the benefits of ServSwitch Secure KVM Switches with USB and more. If someone tries to tamper with the switch, you'll know it. The special Common Access Card (CAC) reader USB port on this switch enhances its functions and gives you even more fail-safe security features.

- Because this switch features a Common Access Card (CAC) reader USB port, it meets the requirements of the Department of Homeland Security Presidential Directive 12 (HSPD-12). The USB port for the card reader will only accept an approved device. Question? Contact our FREE Tech Support.

- Active authentication verification enables you to verify that you have an authentic unit and to check the internal tamper detection circuits.
- Active tamper detection will permanently disable the operation of the switch if tampering is detected. It also denies subsequent authentication attempts.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

NOTE: For TEMPEST approval questions or documents, call our FREE Tech Support.

NOTE: For VGA applications, adapters are required: FA461 for monitors or FA462 for computers.

3. Prevent electronic snooping.

Threat: Subversive snooping by detecting electromagnetic radiation emitted from the equipment.

Solution: The shielded metal case features double shielding in critical areas and a low emissions profile to thwart eavesdropping.

Threat: Physically tampering with the switch.

Solution: The switch is designed with tamper proof seals to be fitted over the countersunk screws.

** NSA tested and TEMPEST approved for and by the U.S. Air Force. Other agencies under review for approval.*

ServSwitch Secure KVM Switch

USB, DVI, EAL2+

2-Port [SW2008A-USB-EAL](#)
4-Port [SW4008A-USB-EAL](#)

USB, VGA, TEMPEST-Approved, EAL2+

2-Port [SW2006A-USB-EAL](#)
4-Port [SW4006A-USB-EAL](#)

USB, VGA, Card Reader, TEMPEST-Approved, EAL2+

2-Port [SW2009A-USB-EAL](#)
4-Port [SW4009A-USB-EAL](#)

USB, DVI or VGA TEMPEST-Approved*

2-Port [SW2007A-USB](#)
4-Port [SW4007A-USB](#)

Plus with USB, 4-Port, CAC Reader

[SW4007A-USB-PLUS](#)

ServSwitch Secure KVM Switch Cable

VGA and PS/2 to HD26 [EHNSECURE1-0006](#)
VGA and USB to HD26 [EHNSECURE2-0006](#)
VGA, USB, CAC USB to HD26 [EHNSECURE3-0006](#)

For connections to a DVI-I switch, order...

ServSwitch DVI Cable

1.8-m [EHN900024U-0006](#)
3.0-m [EHN900024U-0010](#)

Shielded Audio Cable for ServSwitch Secure

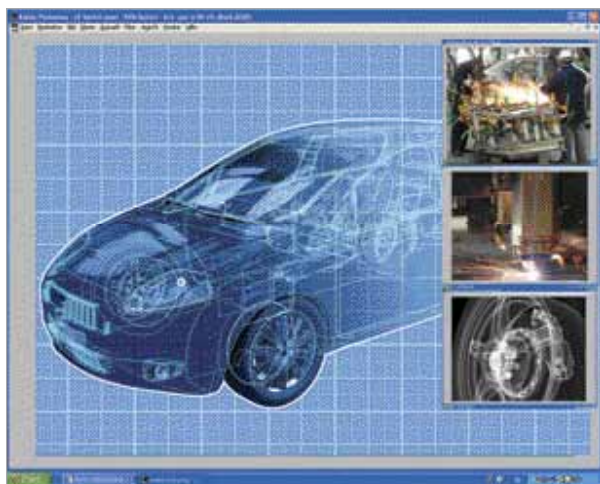
2.7-m [EJ4007-0009](#)

For full features, specs and pricing details, go to www.blackbox.fi

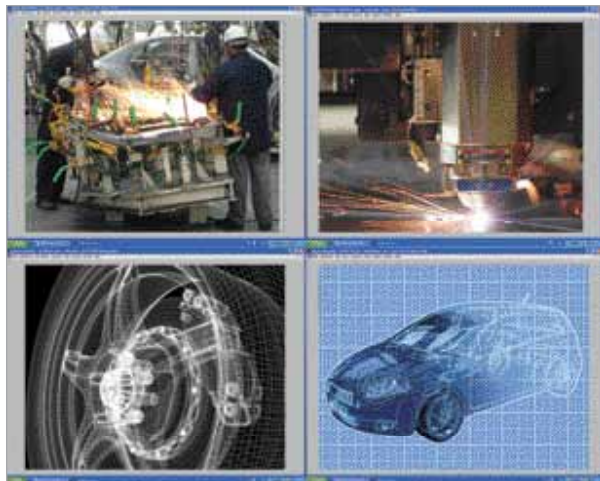
Fluid video performance in all-in-one, 4-port KVM switches and

ServSwitch 4Site II

- 4-to-1 KVM switching with smooth, real-time image processing: DVI, VGA, HDMI, HDCP support.
- View in single-video format, all four video screens in a quad-tiled format, or picture-in-picture video.
- Compatible with all combinations of DVI and VGA (graphics cards and monitors).
- Supports resolutions up to 1920 x 1200 pixels at 60 Hz.
- Touchscreen compatible.
- Embedded digital audio.
- Transparent USB 2.0 peripheral matrix switching.
- Ensures short reaction times in mission-critical applications.



In Picture-in-Picture Mode, you can view the full screen display on one video source along with smaller images from the three other video sources.



In Quad Mode, you can view the entire screen from four different video sources.



KVP4000A-R3

- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

The ServSwitch™ 4Site provides control and real-time monitoring for up to four PCs from one console with a keyboard, video, and mouse. This classic four-port KVM switch also features simultaneous monitoring of up to four different computer video sources on a single screen. Two models, the 4Site II and the 4Site Flex, have slightly different capabilities, with the 4Site Flex being more advanced. The two most important differences in the 4Site models are that the Flex supports High-Bandwidth Digital Content Protection (HDCP) transmission and offers an additional viewing mode, Windows (Win) Mode.

The ServSwitch 4Site Flex gives you true USB emulation for controlling four servers from one USB keyboard and mouse. The switch offers fluid video performance at full refresh rates without frame dropping, perfect for movies and animated content. HDCP support means the digital data will not be interrupted between the source and the display. This makes video playing during conferences smoother, and is a boon in mission-critical areas that need to be constantly monitored. Additionally, the integrated support for HDCP encryption prevents non-licensed devices from receiving content.

The switches are ready-to-use hardware solutions with a high level of reliability, and they are OS independent. Other ideal applications include working in a control room, or wherever you need to keep track of multiple screens. View them all on one monitor at your workstation instead of setting up a bank of monitors.

Excellent video performance.

ServSwitch 4Site Flex and 4Site II process analog (VGA) and digital video signals (DVI, HDMI by adapter) via DVI-I ports as both input and output. Various video modes, including HDTV up to 1920 x 1200, are supported in any combination as input and output.

When the 4Site Flex is scaling videos up and down, the highly sophisticated 6-symbol interpolation filter guarantees brilliant image quality and sharp text readability. The 30-bit RGB video engine ensures extremely precise color rendering as required in broadcasting.

Display modes.

Both 4Site models feature the following viewing modes: Full Screen, Picture-in-Picture (PiP) Mode, and Quad Mode (or Dual Mode if there are only two connected computers).

In **Full Screen**, a single source is displayed at full resolution and the entire content is fully visible. With the 4Site Flex, each image can be rotated for vertically mounted displays.

Picture-in-Picture (PiP) Mode combines more than one video signal for output on a single screen. Using the PiP Mode, a single main image displays in full output resolution, and up to three of the other video signals are displayed on the right side of the main picture. These images can be scaled to a specific, configurable size and position.

video processors for monitoring and control.

ServSwitch 4Site Flex

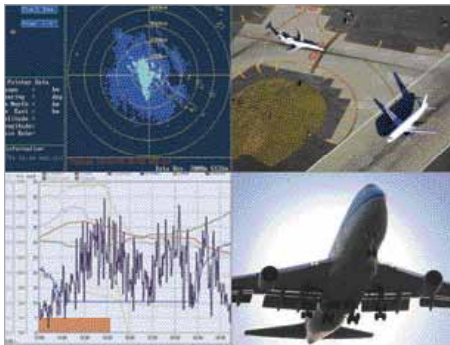
Full feature set of the 4Site II, plus:

- Image rotation for vertical mounted displays.
- Ideal for distributed transaction processing (DTP), programming, trading, and control rooms.
- Supports Win-Mode with freely sizable transparent pictures-in-pictures.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



KVP4004A

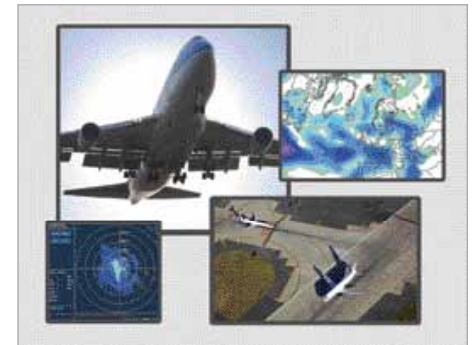
▶ Watch our video: www.blackbox.fi/4SiteVideo



Quad Mode



PiP Mode



Win Mode

Similar to PiP Mode, in **Quad Mode**, the output video signal receives all four incoming video signals sharing the screen with four equal tiles (scaled). Each tile displays the entire screen content of a video source or computer. This mode will also work with two video signals (**Dual Mode**) instead of four.

In addition to these modes, the ServSwitch 4Site Flex features Windows, or Win, Mode. Using **Win Mode**, all video sources can be freely resized and independently repositioned anywhere on the display, just like windows. They can overlap each other transparently. Resizing and repositioning are done by mouse or touchscreen. Four customized Win modes can be saved for quick activation, e.g., via front buttons 1–4.

No matter which of the multiviewing modes is activated, you still have full keyboard and mouse control of the selected server. Intuitive hotkey or hotmouse switching between the

screen tiles swaps the main screen and gives you full keyboard and mouse control to the new target computer. A simple hotkey takes you back into non-scaled, full-screen operation in case of an emergency on one of the selected servers.

The 4Site Flex also enables switching via a serial port using the protocol DCP XML, and by using a USB touchscreen.

More Flex features.

ServSwitch 4Site Flex features a transparent, high-speed USB 2.0 matrix to switch USB devices like fingerprints, memory sticks, and webcams to the connected computers. The switching can be performed automatically with the active channel, or manually without warning. For example, data can be copied from one computer to the other without being networked—simply use a memory stick connected to one of the four USB 2.0 ports on the rear panel of 4Site Flex.

Lastly, the 4Site Flex supports 7.1 Surround Sound via HDMI input. Audio signals are put out via HDMI, S/PDIF (TOSLINK® and RCA), or 2-channel analog stereo jack. The analog output is galvanically isolated to eliminate noise and humming induced by ground loops. The volume can be controlled via the on-screen display (OSD) or with the audio keys on multimedia keyboards.

ServSwitch 4Site

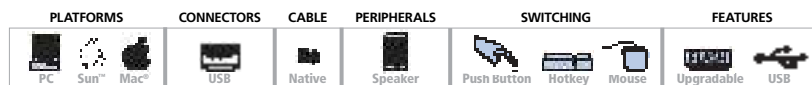
4Site Flex	KVP4004A
4Site II	KVP4000A-R3

Remember to order cables.

1.8-m	EHN900024U-0006
3.0-m	EHN900024U-0010
4.5-m	EHN900024U-0015

For full features, specs and pricing details, go to www.blackbox.fi

Switching between four separate computer systems is as simple as moving a mouse from one monitor to another.



ServSwitch Freedom and LED Accessory



- Ideal for command and control centers or for stock trader desks—any application that needs speedy switching between monitors.
- A flexible, 4-port professional-grade switch for simplifying USB keyboard/mouse access to multiple computers.
- Switch ports by moving your mouse from monitor to monitor.
- Enables a single user to switch between four monitors and attached CPUs, and share USB peripherals between them.
- Features two independent USB 2.0 channels for switching between high-speed USB 2.0 peripherals.
- LED system makes it easy to see which monitor is actively being controlled by the keyboard-mouse setup.
- Supports “quick-fire” switching via hotkeys, a mouse, or front-panel buttons.
- Features stereo audio.
- **Standard Warranty — 2 Years**
- **Extended Warranty — 1 Year or 3 Years**

The ServSwitch™ Freedom™ enables a single USB keyboard/mouse user to easily access information and control operations across four USB computer systems and monitors, saving time and money.

With the ServSwitch Freedom, you can perform functions that ordinarily would require four separate keyboard/mouse sets—freeing up valuable desktop space and simplifying your work. The Freedom works as if you had an extended desktop on a single computer. Instead, you have four PCs, and all you need to do is configure your screen layout. Switching ports is as simple as moving your mouse cursor over the screens' X and Y borders.

It's ideal for professionals in command and control applications, such as those in finance on a trading room floor. Not only can users switch between several computers just by moving the mouse, but they can also

simultaneously access a mix of USB peripherals, including high-speed USB 2.0 devices.

When properly configured, the switch has two switched USB Type A ports for the USB 2.0 peripheral connectivity, in addition to its four USB Type B ports for computer channels and two USB Type A ports for USB keyboard/mouse connections.

The keyboard/mouse, audio, and the two individual USB channels can be collectively or separately switched through to each computer system. You can, for instance, create e-mails on one system, listen to audio on a second system, print from a third computer, and scan documents on another—all at the same time.

The Freedom LED system is a 10-port accessory that supports up to 10 LEDs of variable brightness and colors. Connected to the ServSwitch Freedom, the LEDs show where the keyboard/mouse (K/M) controls are located. Each LED designates a monitor connection, so this device can support up to 10 monitors.

Users don't need to install any software on the connected computers, so setup is simplified and you won't create any security issues in the process—a real concern in government, healthcare, and banking environments.

In addition, the ServSwitch Freedom works with all known software and operating systems, including Windows®, Linux®, Mac®, Sun™, UNIX®, and NetWare® systems.



Watch our video: www.blackbox.fi/FreedomVideo

ServSwitch Freedom

ServSwitch Freedom

KV0004A

□ Includes (1) ServSwitch Freedom, (1) power adapter with (1) power cord, (4) self-adhesive rubber feet, and (1) software CD.

Freedom LED Accessory

KV0004A-LED

For full features, specs and pricing details, go to www.blackbox.fi

1-1-2 Call Center

The Challenge:

A county-wide emergency 1-1-2 call center was staffed by a single person at a time to handle various types of emergency calls, including police, fire, and accidents. The center was responsible for sorting calls, sending out the appropriate response team, and communicating with the response team about the situation as well as any obstacles that would impede them from reaching the caller (such as traffic jams or weather-related problems). Information had to be front-and-center and easy to track.



With one person managing a lot of data, an emergency call center benefits from instant switching.

The Solution:

By connecting computers in sets of four to monitors, and then connecting the ServSwitch Freedom, Black Box techs demonstrated how managing a large amount of incoming information could be as simple as using a keyboard/mouse to access servers and monitors. With the Freedom in place, the call center staff

member can quickly track incoming calls, see what resources are available from the emergency departments (ambulance, fire trucks, EMS, police), and make the necessary response. Other computers can be used to transcribe phone calls, and then communicate the conditions of the emergency to responding

personnel. With another monitor set up to receive information about traffic and weather conditions, all the vital information is at the fingertips of a single person. Additionally, the Freedom reduces clutter and lowers costs by using fewer keyboards and mice per computer.



Switching ports with the ServSwitch Freedom is as simple as moving your mouse cursor over the connected monitors' X and Y borders. You can also use "quick-fire" hotkey or front-panel switching.

Switch instantly via a single USB keyboard and mouse set between up to eight monitors and CPUs

Plattform	Anschlüsse	Kabel	Switching	Extras
 PC  Sun™  Mac®	 USB	 USB	 Taste  Hotkey	 Upgradable

ServSwitch TC



ACX1004A

- Pure Keyboard/Mouse Switch based on USB HID.
- Use one USB keyboard mouse set to switch between up to 8 computers and their attached monitors.
- Quick and instant switchign without delay.
- 4- and 8-port versions available.
- Fast switching via Hotkey sequence or push-button.
- Or use the new Glide and Switch Control to switch the active CPU by moving the mouse towards the target monitor.
- Compatible to all USB HID devices.
- Optional LEDs can be attached to display the active monitor.
- Desktop switch with 19" and DIN rail mounting options.
- Power supply and USB cables are included in delivery.
- **Standard Warranty — 2 Years**
- **Extended Warranty — 1 Year or 3 Years**

Today, more and more consoles are controlled by a single user. The ServSwitch TC offers an ergonomic solution to this challenge. A single user can now use one set of keyboard and mouse to switch instantly between up to eight computers and their connected monitors.

USB HID

The ServSwitch TC supports all USB HID devices like keyboard and mouse, and also touchscreens, panels or similar pointing or input devices. The ServSwitch TC reads the data from the connected USB peripherals and mirrors this information 1-to-1 to the connected CPU ports. While switching between the computers, the keyboard and mouse set keeps the connection to all connected CPU active. Thus switching is very reliable and fast.

Switching

Switching between the CPUs is triggered by programmable keyboard sequences. In addition, the ServSwitch TC offers also an RJ-10 port for each CPU output, to add activity LEDs or push button controls to the monitors.

Or use the new Glide and Switch function by panning the mouse cursor beyond the border of the monitor to switch between different monitors that are in vertical or horizontal positioned to each other.

Integration with other systems

In control centers and control rooms, the computers are often located in remote cabinets or secure areas. With these applications, the ServSwitch TC can easily be integrated in KVM extension and switching systems such as the DKM Matrix Switches and Extenders. Please call our Free Tech Support for compatibility questions with your systems.

Mounting

The ServSwitch TC was developed as a desktop switch for applications on a trading desk at control centers and control rooms. The compact enclosure fits also easily into 19" cabinets and racks. Use the optional rackmount kits to mount up to two devices in 1U rack space. For industrial applications, the TC can also be mounted on the DIN rail.

Applications

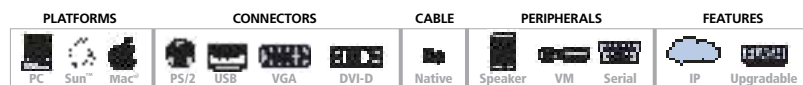
- Space saving workplace.
- Controls up to eight computers with a single keyboard / mouse.
- Central maintenance, configuration or administration.
- Improved hygiene, avoids dust deposition on several keyboard/mouse sets.
- Ideal for industrial, information terminals, convention centers, control centers, trading desks, banks and insurance companies and airports.

ServSwitch TC

4-port	ACX1004A
8-port	ACX1008A
19" rackmount kit for ACX1004A	ACS1009A-RMK
19" rackmount kit for ACX1008A	ACS2209A-RMK
Din rail mounting kit	DRMVACU-S
Activity LED	DACXLED

For full features, specs, and pricing, go to www.blackbox.fi.

Secure, high performance KVM over IP for remote server management.



ServSwitch Wizard IP DXS Gateways

New DVI
support up to
1920 x 1200

- Easily log into and control a computer via the Internet or a corporate network.
- Enables direct KVM-over-IP (KVMoIP) computer management.
- Supports virtual media, via USB, for remote file transfer.
- Network-independent operation. Provides full control during bootup.
- Enables BIOS-level control of a computer during crash states.
- Supports virtual media via USB for easy remote file transfer.
- Highly secure and supports both IPV4 and IPV6 addresses.
- Includes Windows® VNC viewer for configuring settings and making connections.
- Ideal for remotely upgrading or patching distant host systems.
- Enables same-session access by up to four remote users at one time.
- Compact, palm-sized unit can be rackmounted in the ACU5000A.
- DVI option fits perfect with ServSwitch DTX, Agility and DKM for mission critical remote access.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



The ServSwitch Wizard IP DXS Gateways eliminate bottlenecks in mission-critical server administration. Connected to each of your servers, these small-form-factor IP engines provide system administrators with full non-blocking remote access from anywhere in the world. With them, you get full control of a connected CPU or server down to the BIOS level.

Their small size and included Windows® VNC viewer application make this KVM-over-IP solution ideal for enterprise remote management.

The IP gateways enable an authorized remote user to transfer files and folders to a host computer just as if the files and folders were presented locally on a removable CD-ROM or other storage media. Files can be transferred via IP onto the gateway and onto the target computer by means of a USB virtual media port.

Use them, for instance, to remotely upgrade or patch host systems in another location—a real time-saver when this has to be done on many computers in many offices.

Plus, they offer high-quality video performance. This makes them ideal for

healthcare imaging, graphics studio, engineering visualization, control room, and similar HD video applications. The ServSwitch Wizard IP DXS, Single-Server IP Gateway with DVI (ACR101A-DVI) accepts any single-link DVI-D input at up to 1920 x 1200 resolution, but with the addition of a video adapter, it can also be attached to a computer with HDMI® or DisplayPort DP++ (dual-mode) output. The other two gateways are VGA only.

Use the gateways anywhere on your network. They can be placed within a LAN behind any firewall or router connection to the Internet, or be placed externally to the local network, on a separate subnetwork, or with an open Internet connection.

Connect directly to your PC for direct single target access, or connect an existing KVM switch to support more than one server or computer. With a dual access gateway you can connect one local user to a KVM and one remote user via IP.

The IP gateways include a downloadable Windows VNC Viewer for configuring and

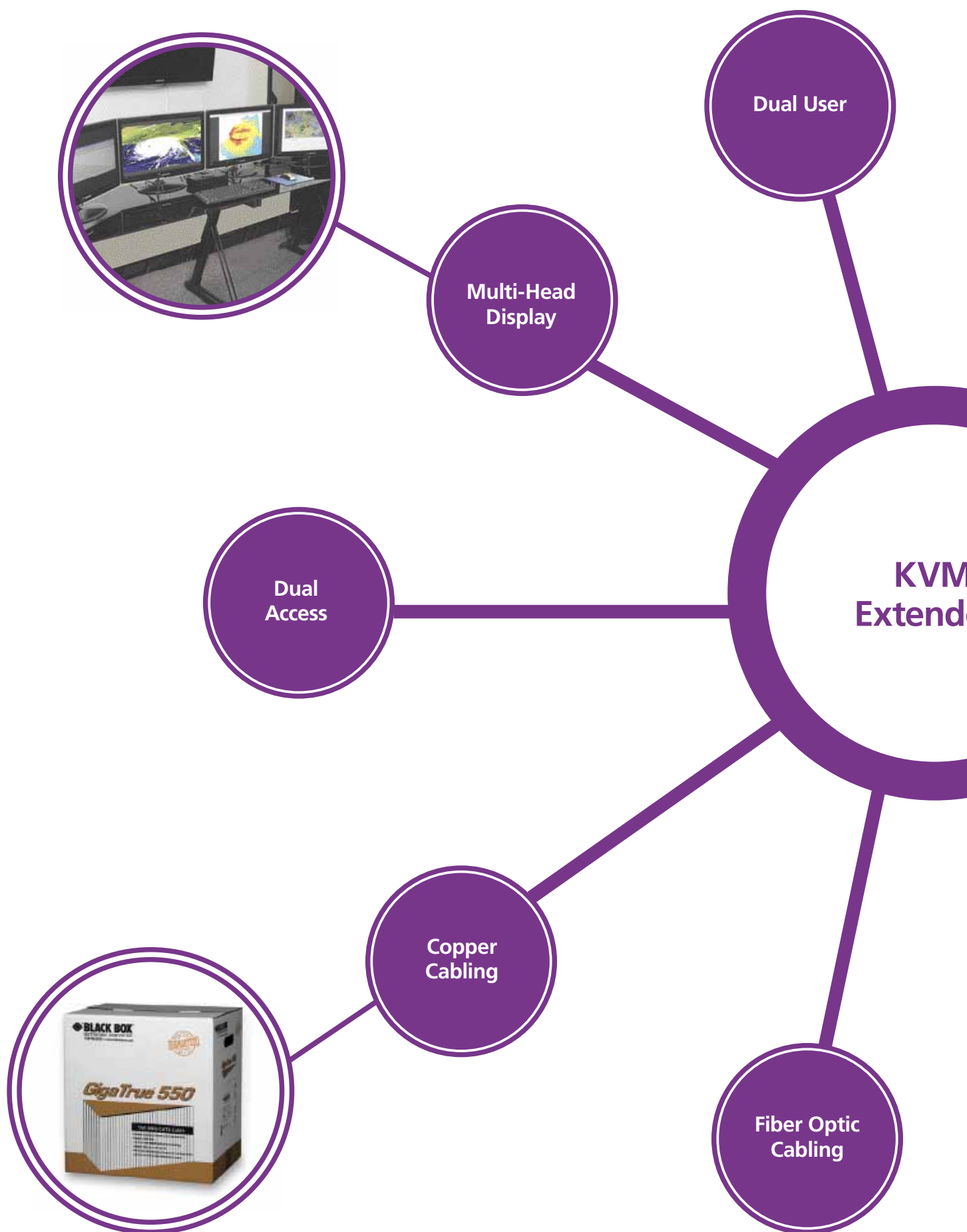
managing remote connections using a computer or mobile device. Or you can use it with a VNC viewer program of your choice. You can create up to 16 user profiles with defined access rights, and the gateway itself can be accessed by up to four users simultaneously, with each user viewing and controlling the same session.

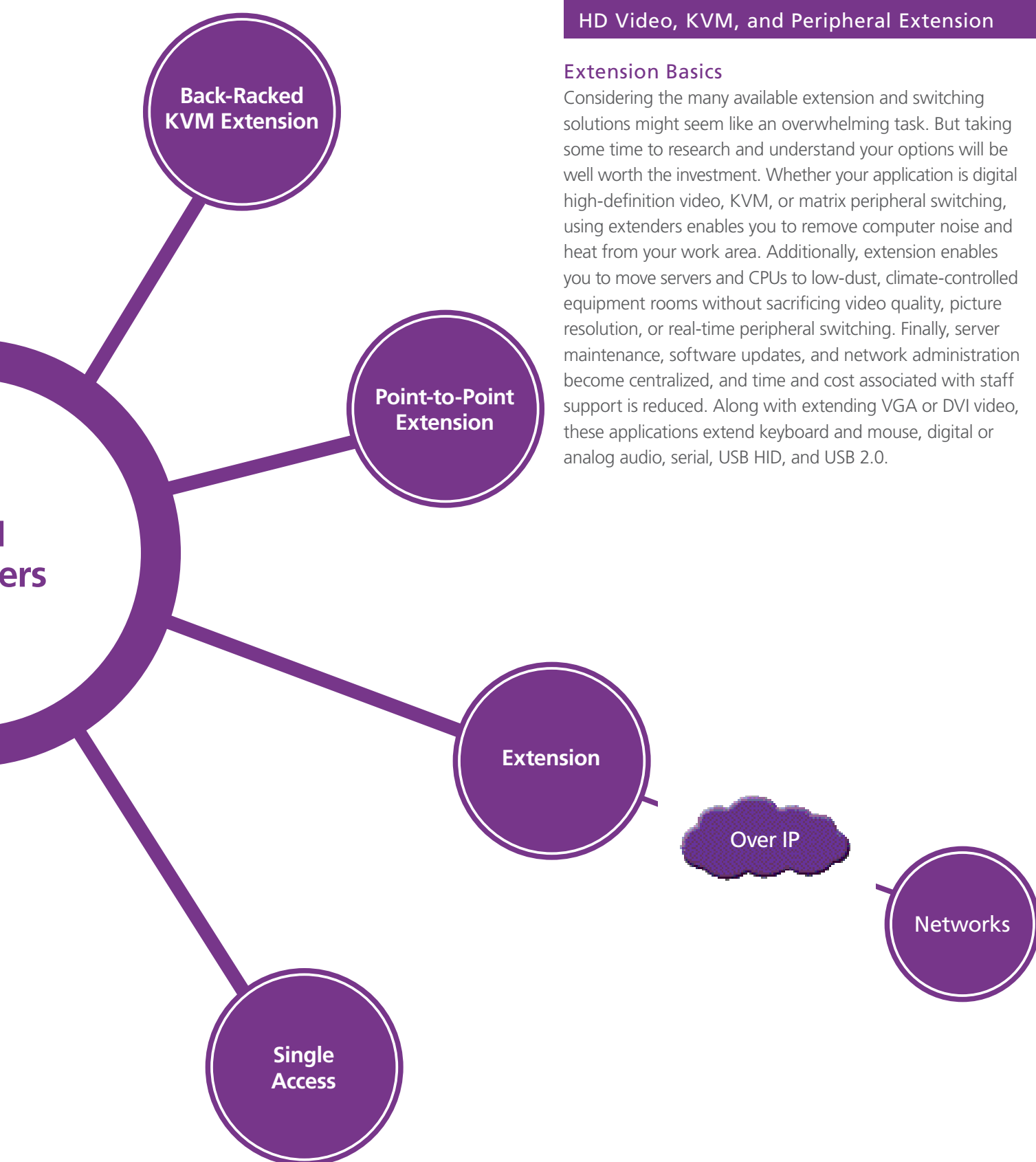
Also, they support both IPV4 and IPV6 Internet addresses, and for enterprise-grade security, the gateways use AES 128-bit encryption and RSA 2048-bit public key authentication. The VNC viewer can also be set up for ciphered user communications.

ServSwitch Wizard IP DXS, IP Gateway

Dual Access	ACR201A
Single Access	ACR101A
Single-Server IP Gateway, DVI	ACR101A-DVI

For full features, specs and pricing details, go to www.blackbox.fi





HD Video, KVM, and Peripheral Extension

Extension Basics

Considering the many available extension and switching solutions might seem like an overwhelming task. But taking some time to research and understand your options will be well worth the investment. Whether your application is digital high-definition video, KVM, or matrix peripheral switching, using extenders enables you to remove computer noise and heat from your work area. Additionally, extension enables you to move servers and CPUs to low-dust, climate-controlled equipment rooms without sacrificing video quality, picture resolution, or real-time peripheral switching. Finally, server maintenance, software updates, and network administration become centralized, and time and cost associated with staff support is reduced. Along with extending VGA or DVI video, these applications extend keyboard and mouse, digital or analog audio, serial, USB HID, and USB 2.0.

Purely digital video remains crisp and clean with no loss of quality because there's no conversion.



ServSwitch Wizard SRX DVI-D/USB Extenders

- Recommended link cable shielded CAT5e or higher.
- Ideal for video editing and high performance graphic applications.
- Get resolutions up to 165 MPixels per second per video head, the maximum rate available on single-link DVI connections.
- Deliver bidirectional USB signals.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



Purely digital for pure video.

Ideal for broadcasting, graphic design, medical imaging, and other applications where display performance is critical, the ServSwitch Wizard SRX DVI-D/USB Extenders deliver full DVI digital video without compression or conversion. The extender uses shielded CATx cable to extend keyboard, mouse, and uncompressed single-link DVI-D video up to 59.7 meters.

USB keyboard and mouse support.

These Wizard extenders support bidirectional USB data, enabling USB device extension on the same CAT7a cable. This makes the extenders perfect for distributed workstations where you

want to reduce environmental concerns such as heat and noise, such as in post-production suites. The extenders also support a variety of USB keyboards and mice as well as other human interface devices (HIDs) such as touchscreens.

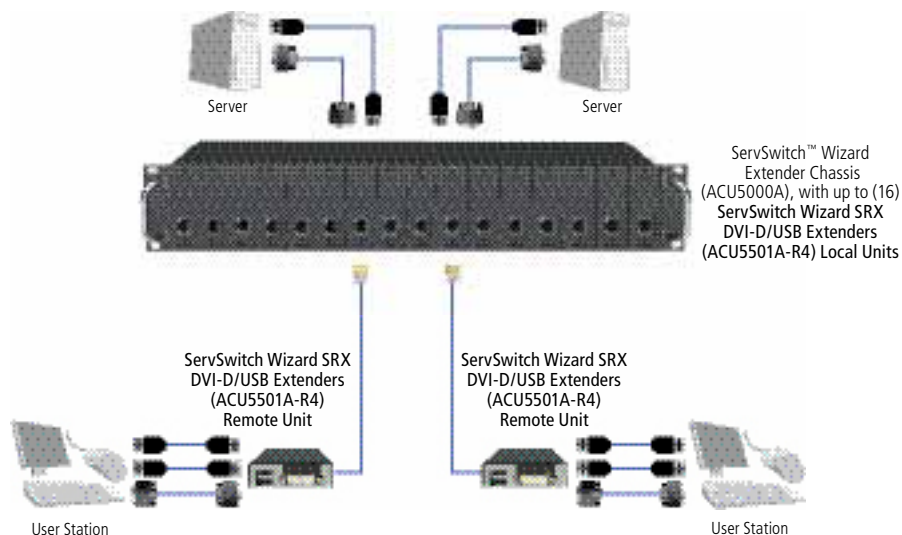
Extended profile DDC EDID.

The Wizard SRX DVI/USB extenders carry extended profile DDC EDID data from your display device to the display adapter to ensure that your system is configured to deliver optimal video performance. The extended profile DDC

EDID is particularly important when extending video to high performance display devices. This is essential for professional graphics users such as in post-production, broadcast, architecture, graphic design, medical imaging, CAD, or any other applications where display performance is critical.

19" mounting.

Because of its small form factor, you can mount up to 16 local or remote units in the ServSwitch Wizard Extender Chassis (ACU5000A).



ServSwitch Wizard SRX DVI-D/USB Extenders

Single-Head	ACU5501A-R4
Dual-Head	ACU5502A-R3

ServSwitch Wizard Extender Chassis
For up to 16 Local or Remote Units

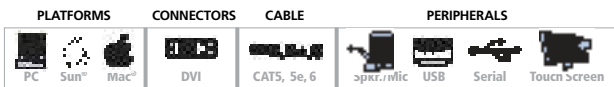
[ACU5000A](#)

5-VDC Power Supply

[PS649-R3](#)

For full features, specs and pricing details, go to
www.blackbox.fi

Full HD resolution and real-time transmission without the delays and compression that degrades the viewing experience.



ServSwitch KVM Extender, DVI-D, USB 2.0 over CATx



- Link up to 100 meters using only one CATx cable.
- Full HD resolution. 1920 x 1200 at 24-bit color depth.
- Provides USB 2.0 support for all device types.
- True EDID read mode.
- HDCP is not supported.
- No compression, no delay of video data.
- Easy setup, no adjustments.
- Supports all major operating systems.
- Uses a single, solid-core CAT5 (or better) cable for desktop extension, simplifying installation. Solid-core CAT6 is recommended for best performance.
- A computer can be located remotely from a desktop area, freeing up space and providing security.
- Servers, computers, software, and any other sensitive hardware can be kept in a secure location where maintenance can be performed easily.
- Supports USB 2.0 devices.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

Place a computer up to 100 meters from the workstation area, connected with a single inexpensive CATx cable. The extender supports Full HD video and USB 2.0, including control of the keyboard, mouse, Web cameras, Flash drive, speakers, microphone, and other USB 1.1 and USB 2.0 devices.

The ideal high-resolution KVM extender.

The ServSwitch™ DVI-D with USB 2.0 KVM Extender preserves the quality of the DVI video signal and offers real-time transmission without the delays and compression that degrades the high-resolution viewing experience.

Technical Specifications

Approvals	CE, RoHS
Connectors	Local unit: (1) DVI-D F, (1) USB Type B F, (1) RJ-45 interconnect, (1) barrel connector for power; Remote unit: (1) DVI-D F, (3) USB Type A F, (1) RJ-45 interconnect, (1) barrel connector for power
Dimensions	11.2 x 17.5 x 3 cm (hwxwd)

USB HID support.

The extender supports a variety of HID. Keyboards and mice are the most common HIDs, but other devices based on HID protocol, including some touchscreens, will work as well.

DDC read channel.

The DDC read capability enables true EDID information to be received from the attached display. This guarantees optimum plug-and-play support.

ServSwitch KVM Extender DVI-D, USB 2.0 over CATx

ServSwitch KVM Extender DVI-D, USB 2.0 over CATx
[ACU1500A](#)

For full features, specs and pricing details, go to www.blackbox.fi.

High-definition extension ideal for medical imaging, interactive digital signage, and high-end home theater.

PLATFORMS	CONNECTORS	CABLE	PERIPHERALS
 PC  Sun™  Mac®	 USB  HDMI	 CATx, 5e, 6	 USB

ServSwitch HDMI with USB 2.0 KVM Extender, CATx



- Extend HDMI and USB signals up to 100 meters using only one CATx cable.
- Features Extreme USB® Technology.
- Full HD resolution, 1920 x 1200, 1080p, at 24-bit color depth.
- Provides USB® 2.0 support for all device types.
- HDMI/HDCP compliant for extra functionality.
- Supports 3D, 4K, Deep Color, and x.v. Color, as well as lip sync, CEC, and HDCP pass-through.
- Put high-end HDMI players, displays, and other equipment up to 100 meters away from your HDMI host.
- Use with USB 2.0 and 1.1 keyboards, mice, flash drives, and other devices.
- No compression, no delay of video data.
- True plug-and-play operation. No drivers needed.
- Supports all major operating systems.
- Uses a single, solid core CAT5e (or better) cable for desktop extension, simplifying installation. Solid-core CAT6 is recommended for best performance.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

Protect your computer and secure it in a safe place up to 100 meters from your workstation, connected with a single inexpensive CATx cable. The extender supports Full HD video and USB 2.0, including control of the keyboard, mouse, Web cameras, Flash drive, speakers, microphone, and other USB 1.1 and USB 2.0 devices.

The ideal high-resolution KVM extender

The ServSwitch™ HDMI with USB 2.0 KVM Extender preserves the quality of the HDMI video signal and offers real-time transmission without the delays and compression that degrades the high-resolution viewing experience. Now you can take full advantage of the high-def video you get with HDMI and extend those signals 100 meters without compromise. It's ideal for use in applications such as high-end medical imaging, interactive digital signage, home theaters, even industrial controls.

USB HID support

The extender supports a variety of HIDs. Keyboards and mice are the most common HIDs, but other devices based on HID protocol, including some touchscreens, will work as well.

DDC read channel

The DDC read capability enables true EDID information to be received from the attached display. This guarantees optimum plug-and-play support.

What's included

- HDMI with USB transmitter
- HDMI with USB receiver
- (2) 5-VDC power supplies
- (2) 1.8-m power cords
- (1) 1.8-m HDMI cable
- Rubber feet

ServSwitch HDMI with USB 2.0 KVM Extender, CATx

ServSwitch HDMI with USB 2.0 KVM Extender, CATx
[ACU2500A](#)

For full features, specs and pricing details, go to www.blackbox.fi.

DVI-D extension over fiber cabling without compromise.



ServSwitch DVI-D Plus USB HID KVM Extender Kits

- Link up to 400 meters using only one multimode fiber.
- Support resolutions from 640 x 480 to 1920 x 1200.
- No compression, no delay of video data.
- True EDID read mode.
- Easy setup, no adjustments.
- Embedded audio and HDCP support.
- Supports interlaced video.
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

ServSwitch™ DVI-D Plus USB Extenders give you a choice of USB peripheral connections and preserve the quality of the DVI video signal. They offer real-time transmission without the delays and video compression.

Save fibers

The USB HID Extenders use coarse wave division multiplexing (CWDM) technology to convert the DVI 1.0 compliant video signal and the USB HID data of your workstation to pulses of laser light, which travel along one strand of multimode fiber. For the USB 2.0 High-Speed Extenders, the same technology converts the DVI 1.0 signals from the PC or workstation into optical signals. You can place the remote unit up to 400 meters from the local unit.

USB HID support

The ACS110A and ACS120A support USB HIDs on one or two fiber cables respectively. Keyboards and mice are the most common HIDs, but other devices based on HID protocol, including some touchscreens, will work as well.



A Single Video
Local and remote units.

B Dual Video
Local and remote units.

A. Single Video

Extend DVI-D signals from one video source, plus USB HID connections on two fibers.

[ACS110A](#)

B. Dual Video / Dual Link

Extends DVI-D Single Link from two sources or Dual Link from one source, plus USB HID connections on two fibers.

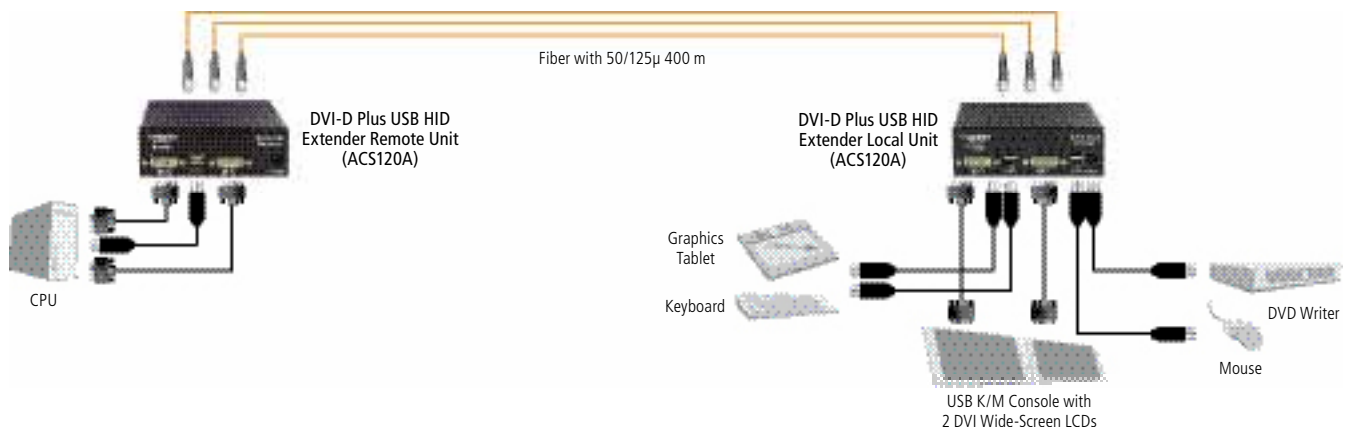
[ACS120A](#)

ServSwitch DVI-D Plus USB HID KVM Extender kits

Single DVI plus USB	ACS110A
Single DVI plus USB, audio, serial	ACS110A-AS
Dual DVI plus USB	ACS120A
Dual DVI plus USB, audio, serial	ACS120A-AS

For full features, specs and pricing details, go to www.blackbox.fi.

Note: Using HDCP content, USB HID is no longer supported.



DVI-D extension without compression or compromise.



ServSwitch DVI-D Plus USB 2.0 High-Speed Extender Kits



- Link up to 400 meters using only one multimode fiber.
- Support resolutions from 640 x 480 to 1920 x 1200.
- No compression, no delay of video data.
- USB 2.0 480-Mbps support.
- True EDID read mode.
- Easy setup, no adjustments.
- Embedded audio and HDCP support.
- Supports interlaced video.
- **Standard Warranty — 2 Years**
- **Extended Warranty — 1 Year or 3 Years**

ServSwitch™ DVI-D Plus USB 2.0 High-Speed Extenders give you a choice of USB peripheral connections and preserve the quality of the DVI video signal. They offer real-time transmission without the delays and video compression.

Save fibers.

The USB 2.0 Extenders use coarse wave division multiplexing (CWDM) technology to convert the DVI 1.0 compliant video signal from the PC or workstation into optical signals (pulses of laser light), which travel along one strand of multimode fiber. For the USB 2.0 High-Speed Extenders, the same technology converts the DVI 1.0 signals from the PC or workstation into optical signals. You can place the remote unit up to 400 meters from the local unit.

USB 2.0 support.

The ACS112A and ACS122A use two and three fiber cables respectively to support transparent USB 2.0 at 480 Mbps. You can attach mass storage devices such as memory sticks, CD-ROM drives, or even DVD writers up to 400 meters from the workstation. Up to four USB peripherals are supported on the 4-port hub at the receiver end.

A. Single Video

Extend DVI-D video from one video source, plus transparent USB 2.0 signals on two fibers.

[ACS112A](#)

B. Dual Video / Dual Link

Extends DVI-D Single Link from two sources or Dual Link from one source, plus transparent USB 2.0 signals on two fibers.

[ACS122A](#)

Technical Specifications

Approvals	CE, RoHS
Connectors	ACS112A: Local Unit: (2) USB Type B; (2) DVI-I F; Interconnect: (2) SC Remote Unit: (2) USB Type A F; (1) DVI-I F; Interconnect: (2) SC; ACS122A: Local Unit: (2) USB Type B; (2) DVI-I F; Interconnect: (3) SC; Remote Unit: (2) USB Type A F; (1) DVI-I F; Interconnect: (3) SC
Power	90–240 VAC, 47–63 autosensing, external, with IEC 320 connector and cord
Dimensions	4.3 x 18 x 13.2 cm (hwxwd)

ServSwitch DVI-D Plus USB 2.0 High-Speed Extender Kits

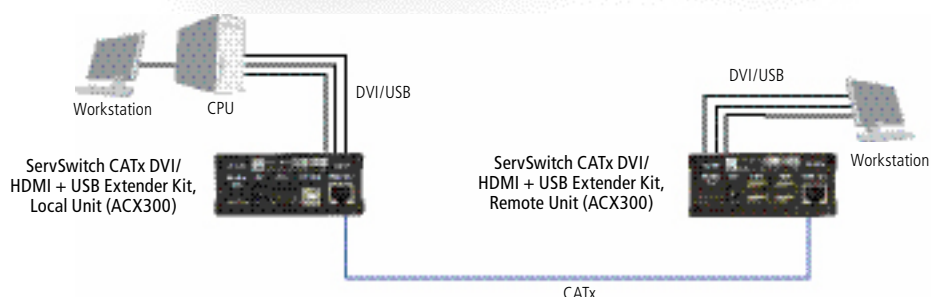
Single DVI plus USB 2.0	ACS112A
Single DVI plus USB2.0, audio, serial	ACS112A-AS
Dual DVI plus USB 2.0	ACS122A
Dual DVI plus USB 2.0, audio, serial	ACS122A-AS

For full features, specs and pricing details, go to www.blackbox.fi.

Optimized for lossless Full HD and USB extension.

PLATFORMS	CONNECTORS	CABLE	PERIPHERALS
 PC  Sun™  Mac™	 USB  DVI-D  HDMI	 CATx, 5e, 6	 USB

ServSwitch CATx DVI/HDMI + USB Extender Kit



- Full HD 1080p resolution up to 1920 x 1200.
- Extends lossless digital video up to 100 meters over CATx cable.
- Also extends USB HID, including touchscreens.
- Plug-and-play installation with DDC/ EDID reading.
- Rackmountable in 19" racks (four units in 1U).
- Other mounting options include wall and table mounting kits.
- Extends audio and RS-232.
- Does not support HDCP or embedded audio.
- Easy to set up—plug and play.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

ServSwitch™ CATx DVI/HDMI + USB Extenders are optimized for state-of-the-art signals such as DVI, HDMI, and USB. The transmission distance of 100 meters is completely lossless using just a single CATx cable.

For HDMI interface, an adapter or cable needs to be connected to the DVI-D video port.

The USB interface supports USB KVM extension, plus other HID devices including USB touchscreens, graphic tablets, sound modules, and serial adapters. Rackmount kits hold up to (4) local or remote units (19" kit), or one local or remote unit (table/wall kit and DIN-rail kit).

ServSwitch CATx DVI/HDMI + USB Extender Kits

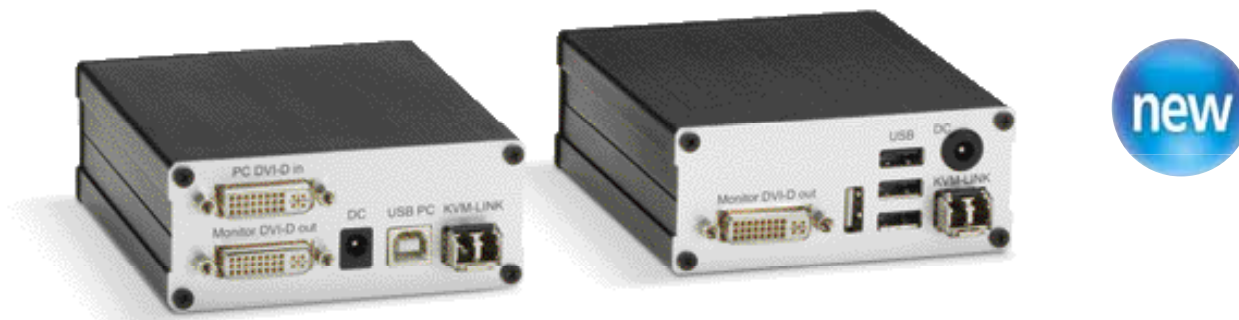
(1) Local Unit, (1) Remote Unit	ACX300
19" Rackmount Kit	ACX300-RMK
Table or Wall Mount Kit	ACX300-TMK
DIN-Rail Mount Kit	ACX300-DRM
USB Storage Media Upgrade Key	ACX300-U2
HDMI-to-DVI Adapter	FA790

For full features, specs and pricing details, go to www.blackbox.fi

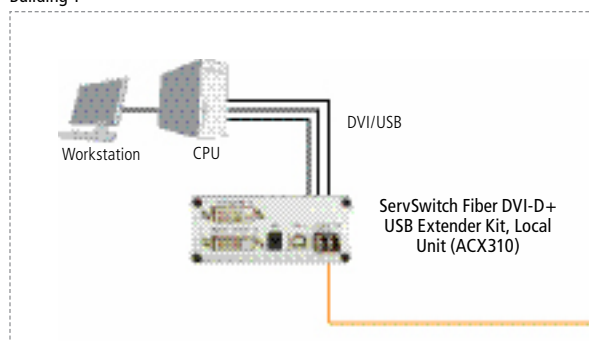
Fiber extension takes lossless video extension even farther.

PLATFORMS	CONNECTORS	CABLE	PERIPHERALS
PC	USB DVI-D	Native Multimode LC®	USB 2.0

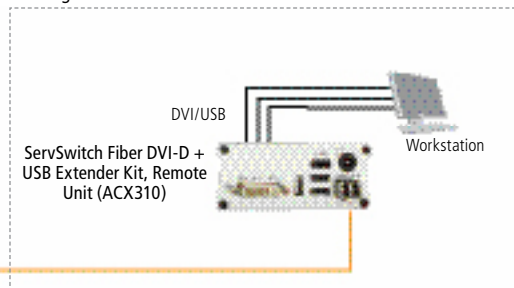
ServSwitch Fiber DVI-D + USB Extender, Kit



Building 1



Building 2



- Full HD 1080p resolution up to 1920 x 1200.
- Extends lossless digital video up to 500 meters over single-mode fiber cable.
- Also extends USB HID, including touchscreens.
- Plug-and-play installation with DDC/ EDID reading.
- Rackmountable in 19" racks (four units in 1U).
- Other mounting options include wall and table mounting kits.
- Extends audio and RS-232.
- Does not support HDCP or embedded audio.
- Easy to set up—plug and play.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

ServSwitch™ Fiber DVI-D + USB Extenders are optimized for state-of-the-art signals such as DVI and USB. The transmission distance of 500 meters is completely lossless using just single-mode or multimode cable.

The USB interface supports USB KVM extension, plus other HID devices including USB touchscreens, graphic tablets, sound modules, and serial adapters. Rackmount kits hold up to (4) local or remote units (19" kit), or one local or remote unit (table/wall kit and DIN-rail kit).

ServSwitch Fiber DVI/HDMI + USB Extender Kits

DVI-D in and out	ACX310F
VGA/DVI in, DVI-D out, plus audio	ACX310FIA
19" Rackmount Kit	ACX300-RMK
Table or Wall Mount Kit	ACX300-TMK
DIN-Rail Mount Kit	ACX300-DRM
USB Storage Media Upgrade Key	ACX310-U2
HDMI-to-DVI Adapter	FA790

For full features, specs and pricing details, go to www.blackbox.fi

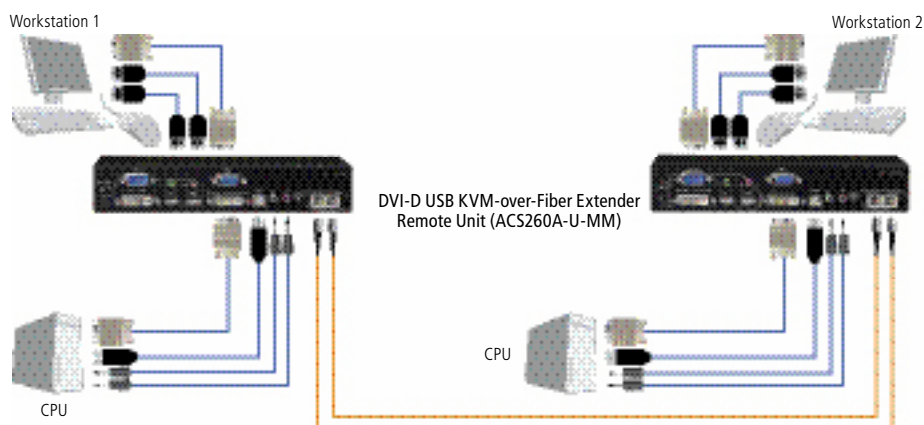
Separate your CPU and user station and still enjoy perfect DVI-D monitor video quality.



ServSwitch DVI-D USB KVM-over-Fiber Extender



- Extends DVI-D video from a computer or KVM switch to a remote USB keyboard/mouse workstation with a DVI monitor.
- Supports full HD resolutions up to 1920 x 1080 for connecting a 1080p display.
- Pure digital extension over fiber optic cable—zero compression technology.
- Supports EDID, stereo audio, and serial port control.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



Use interference-free, ultra-secure 50/125- μ m optical fiber to put a KVM console with a DVI-D monitor up to 2000 meters away from a backracked CPU—without any video compression.

The ServSwitch™ DVI-D USB KVM-over-Fiber Extender sends both DVI-D and USB keyboard and mouse signals over the same fiber cable, transmitting digital video for zero signal loss.

The KVM extender optimizes digital display connections for full HD display resolution (1920 x 1080), so you can extend 1080p to a workstation up to 1000 meters away. For 1080i video, it extends DVI-D video farther—up to 2000 meters. It can also be used to extend HDTV content for high-end LCDs and computer monitors supporting widescreen WUXGA (1920 x 1200) and UXGA (1600 x 1200) displays.

The perfect solution for extending serial data reliably and securely.

High EMI/RFI resistance makes the extender great for connecting control room monitors, keyboards, and mice to factory floor CPUs or

anywhere electronic noise may interfere with communications.

Because the extender uses fiber for extending computer signals, it's ideal for high-security applications. Fiber connection is immune to electromagnetic interference. Use the KVM extender to transmit sensitive data and real-time, high-resolution monitor video in any mission-critical medical, military, and government imaging application. And, as with all Black Box KVM extension solutions, it enables you to keep your computers and valuable data in a locked, secure room and manage them remotely.

Integrates easily into a KVM switch application.

To switch between and control multiple computer CPUs, connect either extender unit to a KVM switch. The extender supports hotkey controls to select a computer, activate a computer scan, and more.

When the extender is connected to a KVM switch, you can also gain access to the built-in hotkey commands of the attached switch. A "mask hotkey" switch on the extender units masks the master-level KVM extender, so you can configure the slave-level KVM switch as if you're sitting directly in front of the switch itself, saving time and reducing errors.

ServSwitch DVI-D USB KVM-over-Fiber Extender

ServSwitch DVI-D USB KVM-over-Fiber Extender

[ACS260A-U-MM](#)

- Includes (1) DVI-D USB KVM extender local unit, (1) DVI-D USB KVM extender remote unit, (1) 30-m fiber optic cable, (2) sets of DVI 2-to-2 USB with audio cables, (2) power adapters, (2) power cords, (2) sets of rackmount brackets and screws, (8) rubber feet pads, and (1) user's manual.

For full features, specs and pricing details, go to www.blackbox.fi

Use with the DKM FX chassis, DKM FXC, or as standalone,

DKM FX and DKM FXC Compact KVM Extenders



*DKM FX Transmitter, CATx, Single DVI, USB HID
Plus Digital Audio (ACX1T-12D-C)*



*DKM FX Receiver, CATx, Dual DVI
Plus USB HID (ACX1R-22-C)*

- Connect users and computers to your DKM FX or DKM FXC while extending them simultaneously over long distances.
- Order one transmitter for each computer connected to the DKM FX.
- Use one receiver for each user within the DKM FX system.
- Choose the cable media depending on your distance requirements. Over CATx, go up to 140 meters; over multimode fiber, go 1000 meters; and over single-mode fiber, go up to 10 kilometers.
- Compact housing enables high-density mounting within 19" racks (up to four devices in 1U).
- Peripheral options for USB HID, transparent USB 2.0, RS-232, analog, and digital audio.
- Also work as standalone point-to-point KVM extension without a DKM FX switch.

Part of the DKM FX and DKM FX Compact (FXC) HD Video and Peripheral Matrix Switching System, the DKM FX Compact Extenders expand the options in an already flexible extension system. DKM FX Compact transmitters and receivers extend DVI-D, USB HID and 2.0, digital audio, and RS-232. These compact extenders work over CATx or fiber cabling, and can work as standalone extenders or within the DKM FX and DKM FXC systems. Some of these extenders work in high-speed applications over fiber, transmitting DVI, USB, serial, and/or audio at speeds of 36 Mbps or 2.5 Gbps. The fiber extenders work over both multimode and single-mode fiber.

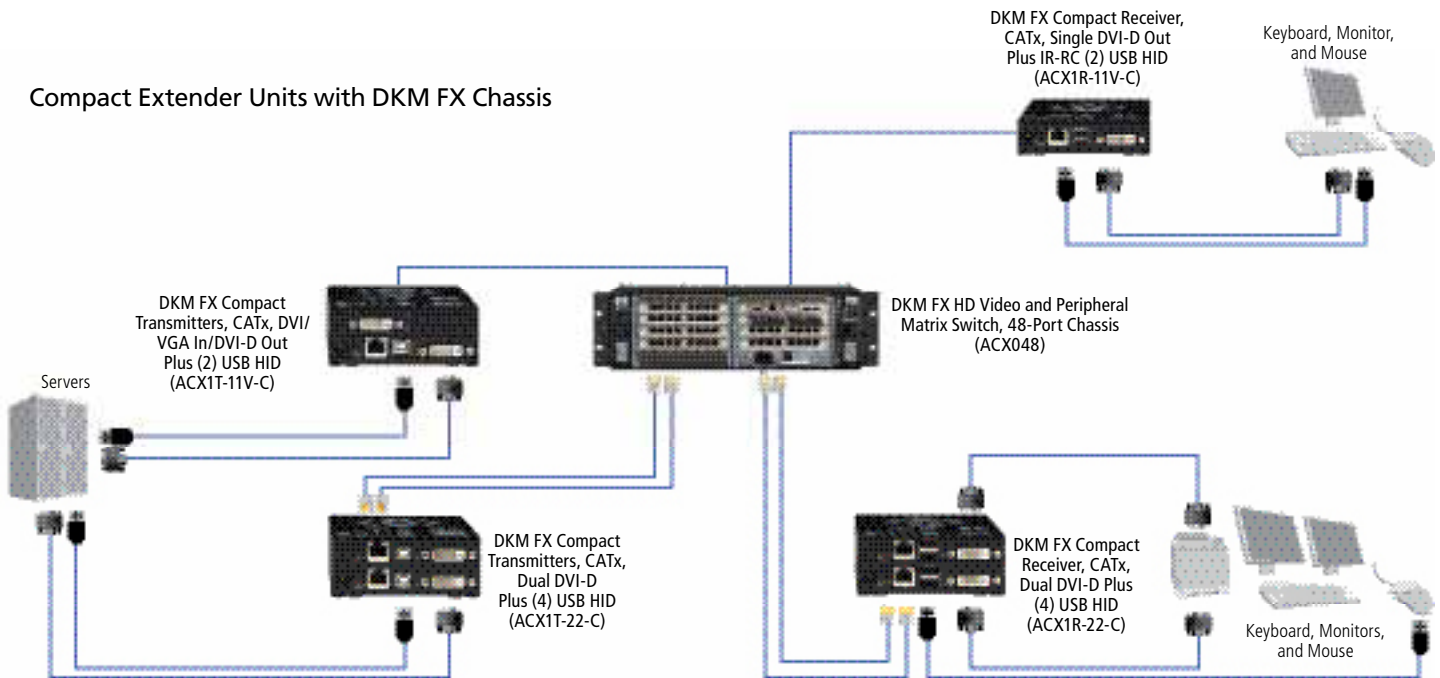
Organizations can combine extender modules depending on their particular needs. These DKM FX components are part of a modular system. You will need to contact Black Box to have them assembled to fit your application. Just call our free Tech Support to configure your DKM FX setup.

Point-to-Point Extension



point-to-point KVM extension.

Compact Extender Units with DKM FX Chassis



DKM FX Compact Transmitters

CATx

Single DVI-D Plus (2) USB HID	ACX1T-11-C
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1T-11V-C
Single DVI-D Plus (4) USB HID	ACX1T-12A-C
Single DVI-D Plus (4) USB HID and Digital Audio	ACX1T-12D-C
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1T-13-C
Dual DVI-D Plus (4) USB HID	ACX1T-22-C
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1T-14A-C

Fiber

Single DVI-D Plus (2) USB HID	ACX1T-11-SM
Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1T-11V-SM
Single DVI-D Plus (4) USB HID	ACX1T-12A-SM
Single DVI-D Plus (4) USB HID and Digital Audio	ACX1T-12D-SM
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1T-13-SM
Dual DVI-D Plus (4) USB HID	ACX1T-22-SM
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1T-14A-SM

Fiber, High Speed Applications

DVI, USB, RS-232, and USB 2.0 at 480 Mbps	ACX1T-13HS-SM
DVI and USB, at 2.5 Gbps	ACX1T-11HS-SM
DVI/VGA and USB at 2.5 Gbps	ACX1T-11VHS-SM
Dual DVI and USB at 2.5 Gbps	ACX1T-22HS-SM
DVI, USB, RS-232, and Audio at 36 Mbps	ACX1T-14AHS-SM

DKM FX Compact Receivers

CATx

Single DVI-D Plus (2) USB HID	ACX1R-11-C
Single DVI-D Out Plus IR-RC (2) USB HID	ACX1R-11V-C
Single DVI-D Plus (4) USB HID	ACX1R-12A-C
Single DVI-D Plus (4) USB HID and Digital Audio	ACX1R-12D-C
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1R-13-C
Dual DVI-D Plus (4) USB HID	ACX1R-22-C
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1R-14A-C

Fiber

Single DVI-D Plus (2) USB HID	ACX1R-11-SM
Single DVI-D Out Plus IR-RC (2) USB HID	ACX1R-11V-SM
Single DVI-D Plus (4) USB HID	ACX1R-12A-SM
Single DVI-D Plus (4) USB HID and Digital Audio	ACX1R-12D-SM
Single DVI-D Plus (2) USB HID and (4) USB 2.0	ACX1R-13-SM
Dual DVI-D Plus (4) USB HID	ACX1R-22-SM
DVI, USB, RS-232, Audio, and USB 2.0 at 36 Mbps	ACX1R-14A-SM

Fiber, High Speed Applications

DVI, USB, RS-232, and USB 2.0 at 480 Mbps	ACX1R-13HS-SM
DVI and USB, at 2.5 Gbps	ACX1R-11HS-SM
DVI/VGA and USB at 2.5 Gbps	ACX1R-11VHS-SM
Dual DVI and USB at 2.5 Gbps	ACX1R-22HS-SM
DVI, USB, RS-232, and Audio at 36 Mbps	ACX1R-14AHS-SM

For full features, specs and pricing details, go to www.blackbox.fi

Flexible, modular KVM extension system takes video, USB,

DKM FX Extender Modular Housing and Interface Cards



DKM FX Housing for Modular DKM Extenders (ACXMODH4-R2)



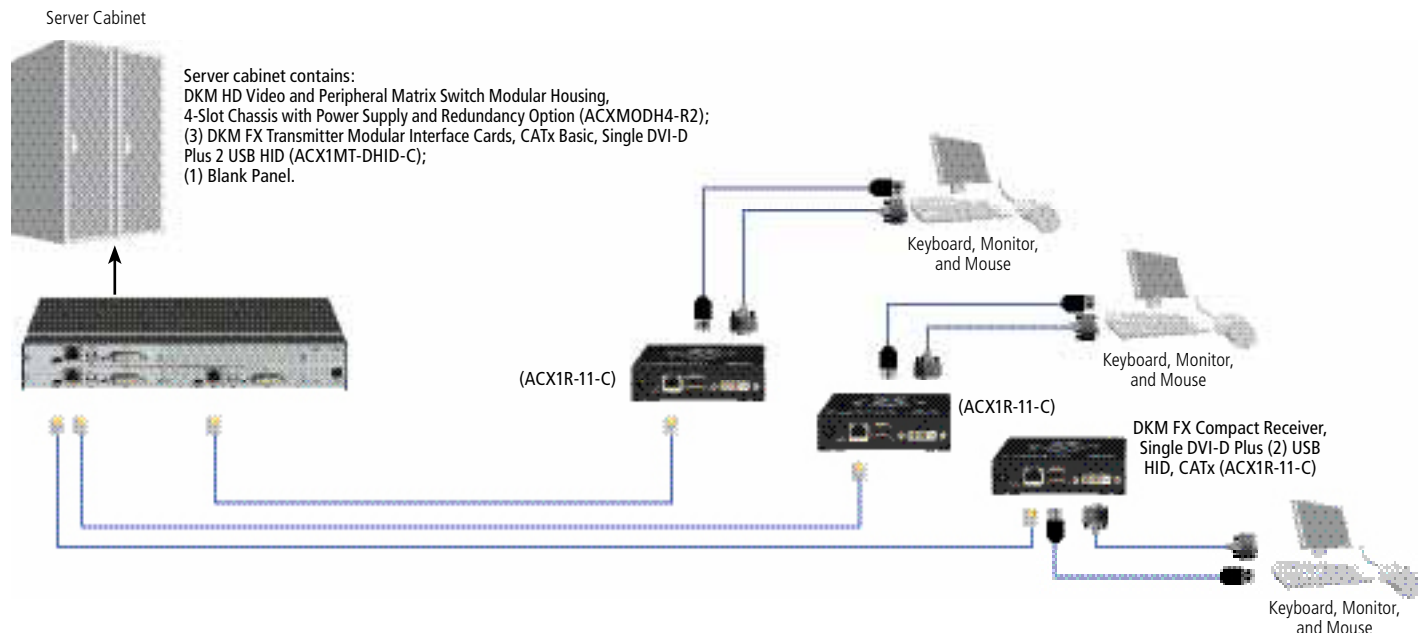
ACX1MT-DHID-SM



ACX1MR-U2-C

- Works as a standalone Point-to-Point KVM Extender
- Connect users and computers to your DKM FX/DKM FXC Switching system while extending them simultaneously over long distances.
- One transmitter is required for each computer connection.
- Use one receiver for each user console within the DKM FX system.
- Design your KVM Extender exactly to fit your interface requirements.
- Choose the cable media depending on your distance requirements. Over CATx, go up to 140 meters; over multimode fiber, go 1000 meters; and over single-mode fiber, go up to 10 kilometers.
- Get Single Link DVI-D video with resolutions up to 2048 x 1152 at 60Hz over the full distance.
- Options for Dual Link DVI-D, HDMI, SDI, HD-SDI and 3G SDI.
- Accepts also input of a variety of analog video formats like VGA, EGA, CGA, MDA, Composite, component or FBAS.
- Peripheral options for USB HID, PS/2, embedded USB 2.0 at 36 Mbps, transparent USB 2.0 at 480 Mbps, RS-232, RS-422, analog, and digital audio.
- Choose a housing depending on your interface requirements with 2-, 4-, 6-, or 21-ports.
- Various power options with AC and DC, internal and external power supplies, with or without redundancy.
- New backplane housing allows hot-swappable replacement of modules reducing down time and inventory costs for spare parts.
- Compatible with the DKM FX Compact Extenders (ACX1T, ACX1R).
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

and serial peripherals long distance.



The DKM Modular KVM Extenders are comprised of modular housing chassis with 2, 4, 6, or 21 slots and transmitter and receiver interface modules. The DKM extender setup provides the widest range of possible combinations, which makes it easy to customize for your specific application.

Modular Design

Housings are available with desktop chassis for two, four, or six boards or use a 19" rackmount chassis for 21 modules. For mission critical applications, all housings are available with redundant power. A DC-power option for industrial usage, can be supplied, too.

Choose one housing with transmitter modules for your computer end and one housing with the corresponding receiver cards at your user station.

The desktop housings can be mounted with optional kits on DIN Rails, walls, under the table as well as in 19" racks. No matter which chassis you select, all ports are arranged on the front side of the chassis to ensure comfortable access while installing and maintaining them.

Basic Link Modules

There are two different types of transmitter and receiver modules. Each housing must be equipped with at least one basic link module offering the cable connection to the remote end. Choose from CATx, fiber at 1 Gbps or high-speed fiber at 2.5 Gbps depending on your distance and bandwidth requirements.

Basic link modules are available with Single or Dual Link DVI-D, DVI-I with VGA input and DVI-D output, or HDMI video plus USB HID.

Special feature modules increase your flexibility even more. The DVI-D splitter module is ideal for redundant video links or applications where one source should be displayed on two different monitors.

HDMI link modules are available with local access at the transmitter for computer control or with an integrated KVM switch at the receiver to connect a local PC. For high bandwidth USB 2.0 extensions, choose the 4-Port USB 2.0 link module allowing transparent USB 2.0 transmissions with 480 Mbps.

Upgrade Modules for additional peripherals

The upgrade modules carry their signals over the cable connections from the basic link modules to save on infrastructure needs. They provide a large variety of peripheral interfaces like USB HID, PS/2, embedded USB 2.0 at 36 Mbps, serial RS-232 or RS-422, bidirectional analog audio and uni-, or-bidirectional digital audio. Mix and match the options according to your application needs.

Converter Modules for analog video inputs

The DKM Modular KVM Extenders also allow the integration of analog video formats like component and composite video as well as industrial video formats like EGA, CGA, MDA. In addition, there are options for SDI, HD-SDI or 3G-SDI available. The modules convert these signals into digital DVI-D signals being losslessly transmitted over the distance.

Point-to-Point Extension or Switched Extension

The DKM Extenders work as a point-to-point extension solution or can be combined with the DKM and DKM FX KVM Switches to build up a free scalable and flexible KVM switching matrix.



ACXMODH21R



ACXMODH2R-R2

Combine your extender interfaces depending on your individual needs

Step 1

Order Transmitter Basic Link modules with DVI-D, DVI-I or HDMI video plus (2) USB HID ports according to your computer interface requirements. Choose from CATx or fiber versions depending on distance: CATx up to 140 meters from computer to console or switch; fiber up to 10 kilometers from computer to console or switch.

Step 2

Choose the upgrade module depending on your peripheral needs.

Step 3

Determine the appropriate housing according to the number of modules chosen in step 1 and 2. Also consider free space for future expansion. Choose from housings with AC or DC power, internal or external power supplies with or without redundancy. The DKM Modular KVM Extenders are factory-installed. However the 6-slot housing is also available with a backplane for hot-swappable module replacements. Use the backplane chassis with your 24/7 mission critical applications.

Step 4

Choose the receiver modules and housing based on your selection for the transmitter side. Using the Modular Extenders in a point-to-point application, the cable media on transmitter and receiver side needs to be the same. In combination with the DKM FX/FXC Matrix Switches you can even mix the media e.g. shorter CATx links on the transmitter side, longer fiber cables to the consoles on the receiver end.

Step 5

Choose a mounting option for the housings, if you like to install it in a 19" cabinet, mount it under a table, on a wall or a DIN rail.

Step 6

Contact us for review of your application and quoting, at **0201 888 888**.

DKM FX Housings for Modular KVM Extenders

DKM FX Housing for Modular KVM Extenders, AC Power

2-Slot with (1) external Power Supply	ACXMODH2-R2
2-Slot with (1) ext. Power Supply + Redundancy Option	ACXMODH2R-R2
2-Slot with (1) int. Power Supply + Redundancy Option	ACXMODH2R-P-R2
4-Slot with (1) ext. Power Supply	ACXMODH4-R2
4-Slot with (1) ext. Power Supply + Redundancy Option	ACXMODH4R-R2
6-Slot with (1) int. Power Supply + Redundancy Option	ACXMODH6R-R2
21-Slot with (1) int. Power Supply + Redundancy Opt.	ACXMODH21R

DKM FX Housing for Modular KVM Extenders, DC Power

2-Slot with (1) 12-VDC Power Supply	ACXMODH2R-P12
2-Slot with (1) 24-VDC Power Supply	ACXMODH2R-P24
2-Slot with (1) 48-VDC Power Supply	ACXMODH2R-P48
6-Slot with (1) 12-VDC Power Supply	ACXMODH6R-P12
6-Slot with (1) 24-VDC Power Supply	ACXMODH6R-P24
6-Slot with (1) 48-VDC Power Supply	ACXMODH6R-P48

DKM FX Housing for Modular KVM Extenders with Backplane

6-Slot with (2) int. AC Power Supplies	ACXMODH6-BPAC
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Accessories for DKM FX Modular Extender Housings

Redundancy Options (AC Power)

Redundancy Upgrade for ACXMODH2-R2	ACXMODH2-R
Redundancy Upgrade for ACXMODH4-R2	ACXMODH4-R
Redundancy Upgrade for ACXMODH2-R	ACXMODH2R-P-R2
Redundant Power Supply for 2-Slot Housings	ACXMODH2-PS
Redundant Power Supply for 4-Slot Housings	ACXMODH4-PS
Redundant Power Supply for 6-Slot Housing	ACXMODH6-PS
Redundant Power Supply for 21-Slot Housing	ACXMODH21-PS

Mounting Options

19" Rackmount Ears for 2-Slot Housing ext. power	ACXMODHEAR-2
19" Rackmount Ears for 2-Slot Housing int. power	ACXMODHEAR-2P
19" Rackmount Ears for 4-Slot Housing	ACXMODHEAR-4
19" Rackmount Ears for 6-Slot Housing	ACXMODHEAR-6
19" Rackmount Shelf for up to (3) 2-Slot, (1) 4-Slot or (1) 6-Slot Housing	ACXMODH-RMK
Table/Wallmount Kit for 2-/4-Slot Housings	ACXMODH-DMK
Table/Wallmount Kit for 6-Slot Housing	ACXMODH-TMK

For full features, specs and pricing details, go to www.blackbox.fi

DKM FX Transmitter Modules for DKM Housings

CATx Basic Link Modules

(1) Single Link DVI-D Plus (2) USB HID	ACX1MT-DHID-C
(1) Single DVI/VGA In/ DVI-D Out Plus (2) USB HID	ACX1MT-VDHID-C
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MT-DHID-C
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MT-DHID-2C
(1) HDMI Plus (2) USB HID	ACX1MT-HDMI-C
(1) HDMI Plus (2) USB HID with local access	ACX1MT-HDM2-C
(1) HDMI only	ACX1MT-HDO-C

CATx Basic Link Module

(4) USB 2.0 Transparent (480 Mbps)	ACX1MT-U2-C
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Fiber Basic Link Module

(1) Single DVI-D Plus (2) USB HID	ACX1MT-DHID-SM
(1) Single DVI/VGA In/DVI-D Out Plus (2) USB HID	ACX1MT-VDHID-SM
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MT-DHID-SM
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MT-DHID-2S
(1) HDMI Plus (2) USB HID	ACX1MT-HDMI-SM
(1) HDMI Plus (2) USB HID with local access	ACX1MT-HDM2-SM
(1) HDMI only	ACX1MT-HDO-SM

Fiber High-Speed Basic Link Module at 2.5 Gbps

(1) Single DVI-D Plus (2) USB HID	ACX1MT-DHS-SM
(1) Single DVI/VGA In/DVI-D Out Plus (2) USB HID	ACX1MT-DVHS-SM
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MT-DHS-SM
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MT-DHS-2S
(1) HDMI only	ACX1MT-HSO-SM

Fiber Bac Link Module

(4) USB 2.0 Transparent (480 Mbps)	ACX1MT-U2-SM
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Upgrade Modules for additional Peripherals

(2) USB HID	ACX1MT-HID
Bidirectional Analog Audio Plus RS-232	ACX1MT-AR
Bidirectional Analog Audio, Unidirectional Digital Audio, Plus RS-232	ACX1MT-ARD
Bidirectional Analog Audio, (2) USB HID Plus RS-232	ACX1MT-ARH
Analog Audio, RS-232, (2) Emb. USB 2.0 (36 Mbps)	ACX1MT-ARE
Analog Audio, PS/2, Plus RS-232	ACX1MT-ARP
Unidirectional Digital Audio	ACX1MT-DA
Unidirectional Digital Audio Plus (2) USB HID	ACX1MT-DAH
Bidirectional Digital Audio	ACX1MT-DAX
Bidirectional Digital Audio, Plus (2) Emb. USB 2.0	ACX1MT-DAE
(2) Embedded USB 2.0 (36 Mbps)	ACX1MT-EU
RS-422	ACX1MT-422

Converter Modules for analog video input

VGA in to DVI-D out	ACX1MT-VGA
RGB in to DVI-D out	ACX1MT-RGB
SDI/VGA/Analog Video in to DVI-D out	ACX1MT-SDI
VGA/EGA/CGA/Analog Video in to DVI-D out	ACX1MT-EGA

DKM FX Receiver Modules for DKM Housings

CATx Basic Link Modules

(1) Single Link DVI-D Plus (2) USB HID	ACX1MR-DHID-C
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MR-DHID-C
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MR-DHID-2C
(1) HDMI Plus (2) USB HID	ACX1MR-HDMI-C
(1) HDMI Plus (2) USB HID with local access	ACX1MR-HDM2-C
(1) HDMI Plus (2) USB HID with KVM Switch for local PC	ACX1MR-HDSW-C
(1) HDMI only	ACX1MR-HDO-C

CATx Basic Link Module

(4) USB 2.0 Transparent (480 Mbps)	ACX1MR-U2-C
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Fiber Basic Link Module

(1) Single DVI-D Plus (2) USB HID	ACX1MR-DHID-SM
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MR-DHID-SM
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MR-DHID-2S
(1) HDMI Plus (2) USB HID	ACX1MR-HDMI-SM
(1) HDMI Plus (2) USB HID with local access	ACX1MR-HDM2-SM
(1) HDMI only	ACX1MR-HDO-SM

Fiber High-Speed Basic Link Module at 2.5 Gbps

(1) Single DVI-D Plus (2) USB HID	ACX1MR-DHS-SM
(1) Dual or (2) Single Link DVI-D Plus (2) USB HID	ACX2MR-DHS-SM
(1) Single Link DVI-D w/ Splitting Plus (2) USB HID	ACX1MR-DHS-2S
(1) HDMI only	ACX1MR-HSO-SM

Fiber Basic Link Module

(4) USB 2.0 Transparent (480 Mbps)	ACX1MR-U2-SM
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Upgrade Modules for additional Peripherals

(2) USB HID	ACX1MR-HID
Bidirectional Analog Audio Plus RS-232	ACX1MR-AR
Bidirectional Analog Audio, Unidirectional Digital Audio, Plus RS-232	ACX1MR-ARD
Bidirectional Analog Audio, (2) USB HID Plus RS-232	ACX1MR-ARH
Analog Audio, RS-232, (2) Emb. USB 2.0 (36 Mbps)	ACX1MR-ARE
Analog Audio, PS/2, Plus RS-232	ACX1MR-ARP
Unidirectional Digital Audio	ACX1MR-DA
Unidirectional Digital Audio Plus (2) USB HID	ACX1MR-DAH
Bidirectional Digital Audio	ACX1MR-DAX
Bidirectional Digital Audio, Plus (2) Emb. USB 2.0	ACX1MR-DAE
(2) Embedded USB 2.0 (36 Mbps)	ACX1MR-EU
RS-422	ACX1MR-422

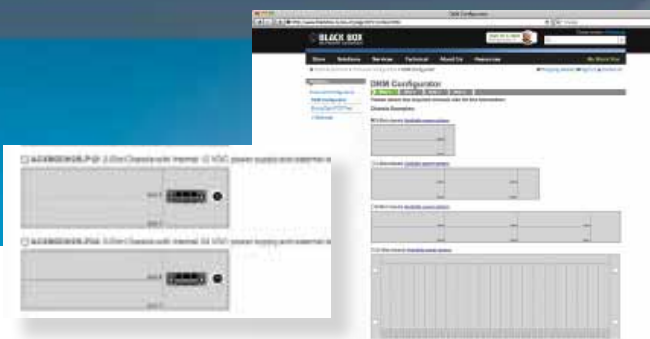
For full features, specs and pricing details, go to www.blackbox.fi

Online configurator

With this tool, you can easily configure a DKM Extender.

For a price enquiry just email us your configuration or contact our Free Tech Support for advice.

www.blackbox.fi/DKMwizard



Transmit single and dual video—plus serial and audio—up to 50 meters away.

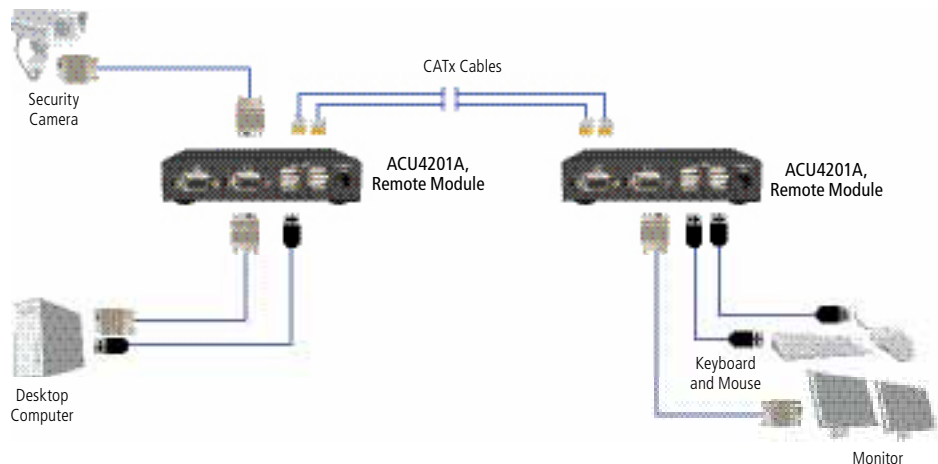


ServSwitch Brand USB Micro Extender Kits



ACU4201A: remote and local unit; front and rear view

- Transmit VGA video, keyboard, and mouse signals up to 50 meters over CAT5, CAT5e, and CAT6 UTP cable.
- Support up to 1600 x 1200 resolution.
- Dual-VGA units support two monitors.
- Serial and audio models enable you to connect devices such as touchscreens and hear audible alarms.
- Remote units include a built-in 4-port USB hub.
- Standalone remote units work with our CAT5 KVM Extender Hubs.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



USB console connections.

Our ServSwitch Brand Micro Extender Kits enable you to place your workstation up to 50 meters away from a server with USB keyboard and mouse consoles. The extenders transparently send VGA and USB 1.1 signals over CAT5/5e/6 cable. And with up to 1600 x 1200 resolution, you get sharp, clear video, even on large monitors.

A 4-port USB hub built into the USB remote units enables you to connect USB 1.1 devices such as memory sticks and PDAs in addition to the keyboard and mouse.

Twice the access.

Dual-access models enable two workstations—one local and one remote—to access a

server. You can have a local workstation in your server room and another in your office or other remote location.

Send serial and audio, too.

The ACU4022A and ACU4222A kits support serial RS-232 signals as well as audio on the same CAT5/5e/6 cable. Use them to connect serial touchscreens and printers. Audio extension provides bidirectional stereo transmission so you can hear audible alarms at your workstation.

All purpose.

All models are flash upgradable and provide local passthrough for video signals so you can connect a local VGA monitor for administration.

ServSwitch™ Brand USB Micro Extender Kits

Single-VGA, USB	ACU4001A
with Serial and Audio	ACU4022A
Dual-VGA, USB	ACU4201A
with Serial and Audio	ACU4222A
Rackmount Kit for CATx Extenders, 19" Rack	RMK19U-X3

For full features, specs and pricing details, go to www.blackbox.fi

Extend high-resolution VGA with USB 1.1 and stereo audio more than 50 meters over CATx cable.



ServSwitch Wizard SRX USB KVM Extenders

- Transparent USB 1.1 and USB 2.0 support up to 50 meters over a single CATx cable.
- Support resolutions up to 1920 x 1440 at 60 Hz.
- Extend video, audio, USB keyboard and mouse signals, and up to two USB peripherals.
- DDC EDID reads from the local display, eliminating plug-and-play issues.
- Local VGA and stereo audio feedthrough.
- Dual-video model also works with RS-232.
- Rack up to 16 units with the Rackmount Chassis for ServSwitch KVM Extender (ACU5000A).
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years

The power of transparent USB.

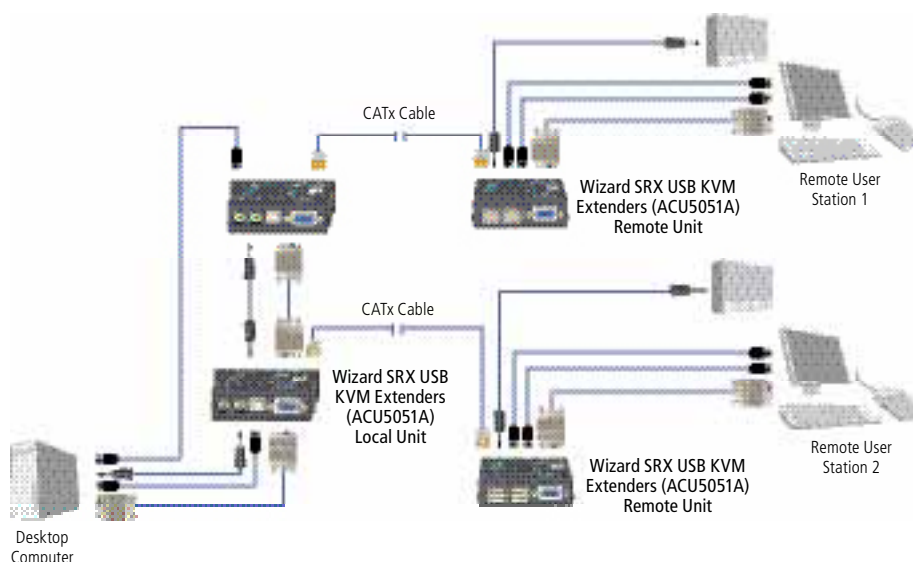
ServSwitch Wizard™ SRX USB KVM Extenders from Black Box combine VGA, USB 1.1 or USB 2.0, and audio, and send them up to 50 meters across a single CATx cable. It's easy to fine-tune the video image on the remote unit and get crystal-clear stereo audio and transparent USB.

DDC EDID read and store support.

Modern graphics adapter cards—even with analog output—require the presence of Display Data Channel (DDC) information. Without it, they output low-quality video or none at all. ServSwitch Wizard SRX USB Extenders read the DDC information from the attached local display and store it in the local unit's non-volatile memory.



ACU5051A: remote and local unit



Support for RS-232.

The dual-video version of the SRX series (ACU5052A) uses two CATx links to transmit the signals. The second video link carries a transparent RS-232 port up to 19.2 kbps.

Local access.

All local units have audio and VGA feed-through, giving you local access just by plugging a keyboard and mouse directly into the spare PC USB ports.

Dual-user configuration.

With two single-video units, you can connect two workstations with keyboards, monitors, and mice to one CPU tower. Two users can use the local connections to monitor and diagnose the CPU. This setup is ideal for a remote CPU that doesn't need to be monitored simultaneously by two users.

ServSwitch™ Wizard SRX USB Extenders

Single-Video, USB and Audio [ACU5051A](#)
Dual-Video, USB, Audio, and RS-232

[ACU5052A](#)

Rackmount Chassis for ServSwitch KVM Extender
For up to 16 Units [ACU5000A](#)

5-VDC Power Supply [PS649-R3](#)

5-VDC Power Supply for Dual
Head Models [PS650](#)

For full features, specs and pricing details, go to www.blackbox.fi

What's included

- Local unit
- Remote unit
- Power supply
- IEC 320 power cord
- VGA cable, ACU5052A (2)
- USB cable A-B
- Audio cable
- DB9 serial cable (ACU5052A only)
- User's manual on CD
- Mounting plate for local or remote unit

Send high-resolution VGA video and USB signals over CAT5 or higher cable.



ServSwitch Brand CATx USB KVM Extenders

- Extend USB and VGA signals over CATx cable up to 300 meters.
- Support high-resolution video: 1600 x 1200 at 60 Hz over 200 meters or 1280 x 1024 at 75 Hz over 300 meters.
- Fully integrated skew compensation cancels color shift and enhances image sharpness.
- Optional bidirectional stereo audio (16-bit digitized) support for high-quality, low-noise audio extension.
- Surge protection on each CATx port and power supply unit provide overvoltage detection.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



ACU6001A: front view



ACU6001A: rear view



ACU6201A: front view



ACU6201A: rear view

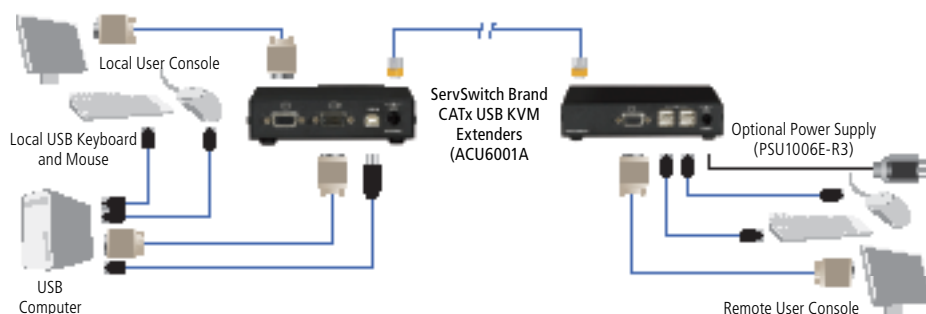
Each ServSwitch Brand CATx USB KVM Extender system includes a local unit that attaches to the CPU (or a ServSwitch) and a remote unit that connects the user's KVM console. You can also plug in a monitor on the local side.

Choose from models that extend single- or dual-head video with or without serial and bidirectional stereo audio signals. A CATx cable is required for each video channel between local and remote ends.

All extenders deliver crystal-clear VGA video. Additionally, the extenders feature emulated DDC on the local units to ensure compatibility with multihead graphics cards. The remote units feature transparent DDC, reading DDC tables from all attached monitors, then transferring and storing data in the local unit to support non-standard displays.

Independent low-frequency and high-frequency cable equalization control ensures optimum video tuning across different cable types, so installation is not costly. Control and video tuning are carried out using the remote keyboard with settings stored in EEPROM memory.

The transparent serial port on the audio-enabled models enables you to extend any serial device up to 19.2 kbps. Extend one device requiring handshaking lines or up to three simple serial devices with no handshaking.



Installing ServSwitch Brand CATx USB KVM Extenders is a plug-and-play procedure with nothing to configure. Local video output enables dual-access operation when a local keyboard and mouse are connected directly to the CPU. With a simple hotkey command, you can switch to a private mode, leaving the remote video dark.

In most applications, the local unit draws its power from the USB interface but, if necessary, it also can be powered externally by the optional Power Supply (PSU1006E-R3). The remote unit requires an external power supply, which is included.

Compact in design, the extender units fit easily on a desktop. Or three units can be rackmounted in 1U of space within a 19" standard cabinet or rack using the optional Rackmount Kit (RMK19U-X3).

ServSwitch™ Brand CATx USB KVM Extenders

Single-Head VGA	
Standard	ACU6001A
with Serial and Audio	ACU6022A
Dual-Head VGA	
Standard	ACU6201A
with Serial and Audio	ACU6222A

- Include (1) local unit, (1) remote unit, (1) 5-V DC power supply for remote unit, (1) power cord, USB and video cables to connect local unit to PC. ACU6222A also includes (1) serial cable and (1) audio cable.

You may also need...

Spare Power Supply	PSU1006E-R3
Rackmount Kit for CATx Extenders	RMK19U-X3

For full features, specs and pricing details, go to www.blackbox.fi

Put distance between your CPU and your USB peripherals in standalone or high-density applications.



ServSwitch Wizard USB KVM Extender with Audio

- Extends transmissions up to 120 meters over CATx between USB peripheral devices and the CPU, including audio.
- Supports resolutions up to 1920 x 1200.
- Ideal for high-density applications where you want to use USB keyboards, mice, and other devices, but the server is not close by.
- Extender package includes a local and a remote unit; the remote unit features a 4-port USB hub.
- Rackmount up to 16 extenders at a time with the optional ServSwitch Wizard Extender Chassis (ACU5000A).
- Dual video option for applications with two monitors (requires second CATx link cable).
- **Standard Warranty** — 2 Years
- **Extended Warranty** — 1 Year or 3 Years



ACU5050A

Put extra distance between your USB-style peripherals and your CPU with the ServSwitch Wizard KVM USB Extender with Audio. The extender is ideal for high-density applications where you want full use of USB keyboards, mice, and other devices, but there simply isn't room for a server nearby, or for applications where you want to keep CPUs secured and out of the way.

All communications use inexpensive CAT5 or higher cable, so there's no special cabling needed to extend a USB bus from a PC to peripherals.

Extend video and audio signals, too.

The extender enables you to transmit more than just signals for USB connections. You can use the same CAT5, CAT5e, or CAT6 cable link to transmit video signals, too.

And to transmit bidirectional audio for microphone or speaker signals for a truly multimedia workstation, just attach a second CAT5 or higher link. The extender package includes a local and a remote unit. Simply connect the local module to your PC or Sun

system and the remote module to the peripherals next to the user. The remote unit contains a built-in USB hub that provides four separate USB 1.1 channels for attaching multiple devices.

Fine-tune images at the remote end.

On the remote unit, video compensation switches and dials enable you to adjust the image and keep the video signal crisp and clear with no "shadowing." Using these functions, you can boost video frequencies to counter the effects of long cable runs. The remote unit also has a signal-boost feature that optimizes less-responsive microphones. To protect against power surges, both modules include internal automatic cut-out fuses.

What's more, you can mount both local and remote units in an optional space-saving chassis, which makes these extenders perfect for fast-growing installations.

Technical Specifications

Approvals	CE, RoHS
Connectors	Local unit: Audio: (2) 3.5-mm jacks; Video: (2) HD15-F; ACU5250A-R2 (4) USB: (1) USB Type B; Interconnect: (1) RJ-45; ACU5250A-R2 (2) Remote unit: Audio: (2) 3.5-mm jacks; Video: (1) HD15-F; ACU5250A-R2 (2) USB: (4) USB Type B; Interconnect: (1) RJ-45, ACU5250A-R2 (2)
Dimensions	2.5 x 7.4 x 16.3 cm (hwxwd)
Weight	Local and remote units: 0.5 kg

ServSwitch Wizard USB KVM Extender with Audio

ServSwitch Wizard USB KVM Extender with Audio
 Single VGA [ACU5050A-R2](#)
 Dual VGA [ACU5250A-R2](#)
 Rackmount multiple local and remote units...
 ServSwitch Wizard Extender Chassis [ACU5000A](#)

To power up to four ServSwitch Wizard Extenders, order...

Rackmountable Power Distribution Module [PS5000-R2](#)

For full features, specs and pricing details, go to www.blackbox.fi

Compact and cost efficient KVM extension over CATx

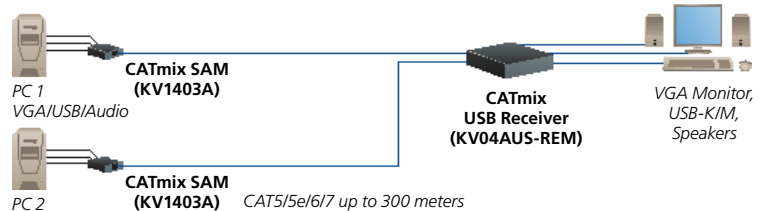
Plattform	Anschlüsse	Kabel	Peripherie	Extras
PC Sun™ mac™	PS/2 USB VGA	CAT5, 5e, 6	Lautsp./Mikro	Upgradeable

ServSwitch CATmix KVM Extender

- Connect users and computers to your DKM FX while extending them simultaneously over long distances.
- Order one transmitter for each computer connected to the DKM FX.
- Use one receiver for each user within the DKM FX system.
- Small form factor.
- Resolutions up to 1920 x 1200.
- Available for VGA and DisplayPort.
- Easy video fine tuning over hotkeys.
- Choose between USB-HID or PS/2 server connections.
- Options with unidirectional audio and DeSkew.
- Distances up to 300 m over CATx.
- Excellent value for money.
- Works perfectly together with ServSwitch CX Switching applications to place an operator in a distant location.
- Compact housing enables high-density mounting within 19" racks (up to four devices in 1U).
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years



VGA/USB/Audio Extension with Switching



The ServSwitch CATmix KVM Extender offer flexible point-to-point extension with access for one user.

USB or PS/2

The transmitter modules (SAMs) mark out by a small zero height design and low weight.

Choose between USB- and PS/2-receivers with or without 44.1kHz audio.

The USB-models feature in addition switching between two separate computers or KVM switching systems. Both models may be combined in the same application.

Distance and Resolutions

Extend Keyboard/Video/Mouse/(Audio) signals without hazel up to 300 meters at

resolutions up to 1280 x 1024 @ 60Hz. Depending on Skew of the Catx link cables, 1600 x 1200 @ 60Hz resolutions can be transmitted up to 100 meters. Over a distance of 50 meters the extenders provide clear and sharp video at a high resolutions up to 1920 x 1200.

Dual Access

With the dual access transmitters, you now have the ability to control two computers over a single console. Choose a model with or without audio.

Use in CX Switching applications

The CATmix KVM receivers work perfectly together with the ServSwitch CX KVM switching

system. Use them to include easily remote user stations to the CX Switches. Choose the CATmix receiver with audio capabilities if you want to hear the acoustic warning signals from your servers.

ServSwitch CATmix KVM Extender

Receivers, Dual USB
 VGA, USB [KV4U-REM](#)
 VGA, USB, Audio [KV4AU-REM](#)
 VGA, USB, Audio and DeSkew [KV4AUS-REM](#)

Receivers, Single PS/2
 VGA, PS/2 [KV4-REM](#)
 VGA, PS/2, Audio [KV4A-REM](#)
 VGA, PS/2, Audio and DeSkew [KV4AS-REM](#)

VGA Transmitters, Single Access
 USB [KV1401A](#)
 USB and Audio [KV1403A](#)
 PS/2 [KV1400A](#)
 PS/2 and Audio [KV1402A](#)
 Sun and Audio [KV1404A](#)

VGA Transmitters, Dual Access
 USB [KV1405A](#)
 USB and Audio [KV1406A](#)

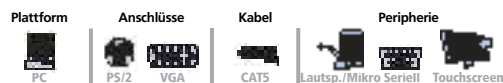
DisplayPort Transmitters, Single Access
 USB [KV1408A](#)
 USB and Audio [KV1409A](#)

For full features, specs, and pricing, go to www.blackbox.fi.

Technical Specifications

Receivers:		Transmitters (SAM)	
Connectors	KV04-REM: (1) RJ-45, (1) HD15 F, (2) MiniDin6 F, (1) 2.1mm barrel 5VDC; KV04A-REM/KV04AS-REM also: (1) 3.5mm audio jack; KV04U-REM: (2) RJ-45, (1) HD15 F, (2) USB type A, (1) 2,1mm barrel 5VDC; KV04AU-REM/KV04AUS-REM also: 3.2mm audio jack	Connectors:	all: (1) RJ-45, (1) HD15 M; KV1400A also: (2) MiniDin6 M; KV1402A also: (2) MiniDin6 M, (1) 3.5, audio jack; KV1401A also: (1) USB type A KV1403A also: (1) USB type A, (1) 3.5mm audio jack; KV1404A: (2) RJ-45, (1) HD15 M, (1) USB type A; KV1405A also: (1) 3.5mm audio jack
Size	all PS/2: 2.5 x 7.5 x 12.5 cm; all USB: 2.6 x 7.5 x 17 cm (hwxwd)	Size	2.5 x 4.5 x 6,5 cm (hwxwd) with 30 cm cable
		Weight	0.5 kg; audio versions: 0.15kg

KVM Extension up to 50 meters at a very attractive price.



ServSwitch VGA & PS/2 Micro Extender

- Drives KVM signals up to 50 metres over your existing CATx infrastructure..
- VGA resolutions up to 1600 x 1200.
- Surge protection on the CATx link.
- Compact design for space-saving integration.
- Options with audio and RS-232/V.24 and dual-head VGA.
- Also available with dual access at the local and remote end.
- Enables you to place CPUs where you want them.
- Keep-Alive function prevents server from lock up in case the link is disconnected.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

The ServSwitch CATx Micro Extender Kits provide KVM remote control of CPUs over a distance of up to 50 meters. Even resolutions up to 1600 x 1200 at 60 Hz are supported over the full distance..

Intelligent keyboard and mouse emulation built into the local module makes the kit compatible with almost all PS/2 platform PCs or servers, including RS/6000™ or HP® UNIX® workstations. It provides keep-alive functionality, so a connected server doesn't lock up, even if the CAT5 link is dispatched or if no keyboard or mouse is present at the remote module.

The Dual-Access versions offer additional connectivity to a local KVM console for on-site administration when direct access to the CPU is required—for instance, to service its hardware. KVM signals are shared between the local and remote console.

Modern graphic adapter cards often allow dual-head VGA output. To fulfil these needs, use the Dual-VGA Micro KVM Extenders. They allow operators to control their processes in comfort while the servers or workstations can be hosted in a separate air-conditioned location.

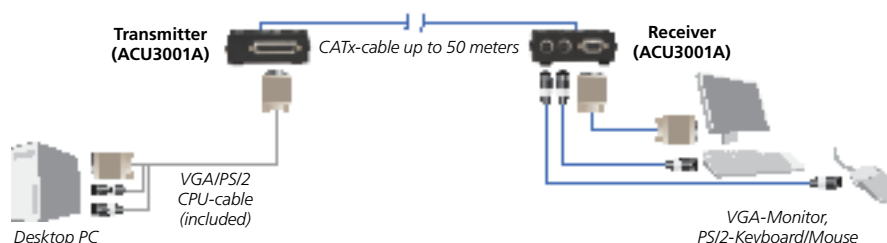
Use the options with bidirectional stereo audio and transparent RS-232/V.24 support (up to 19.2 kbps) to send audio and serial signals across a single CAT5 cable along with the video signal. It's the space-saving, cost-effective solution for connecting a conference room's ceiling-mounted multimedia projectors to a PC or laptop located between 15 and 50 meters away.



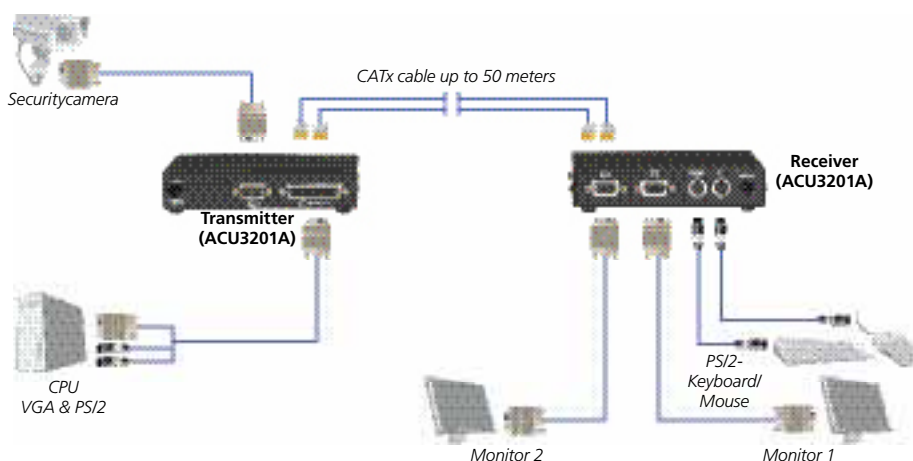
ACU3201A

ACU3009A

Single Video/Single Access Application



Dual Video/Single Access Application



ServSwitch VGA & PS/2 Micro Extender

Single VGA

- VGA, PS/2, Single Access
- VGA, PS/2, Dual Access
- VGA, PS/2, Single Access, Audio and Serial

ACU3001A
ACU3009A
ACU3022A

Dual VGA

- VGA, PS/2, Single Access
- VGA, PS/2, Dual Access
- VGA, PS/2, Single Access, Audio and Serial
- VGA, PS/2, Dual Access, Audio and Serial

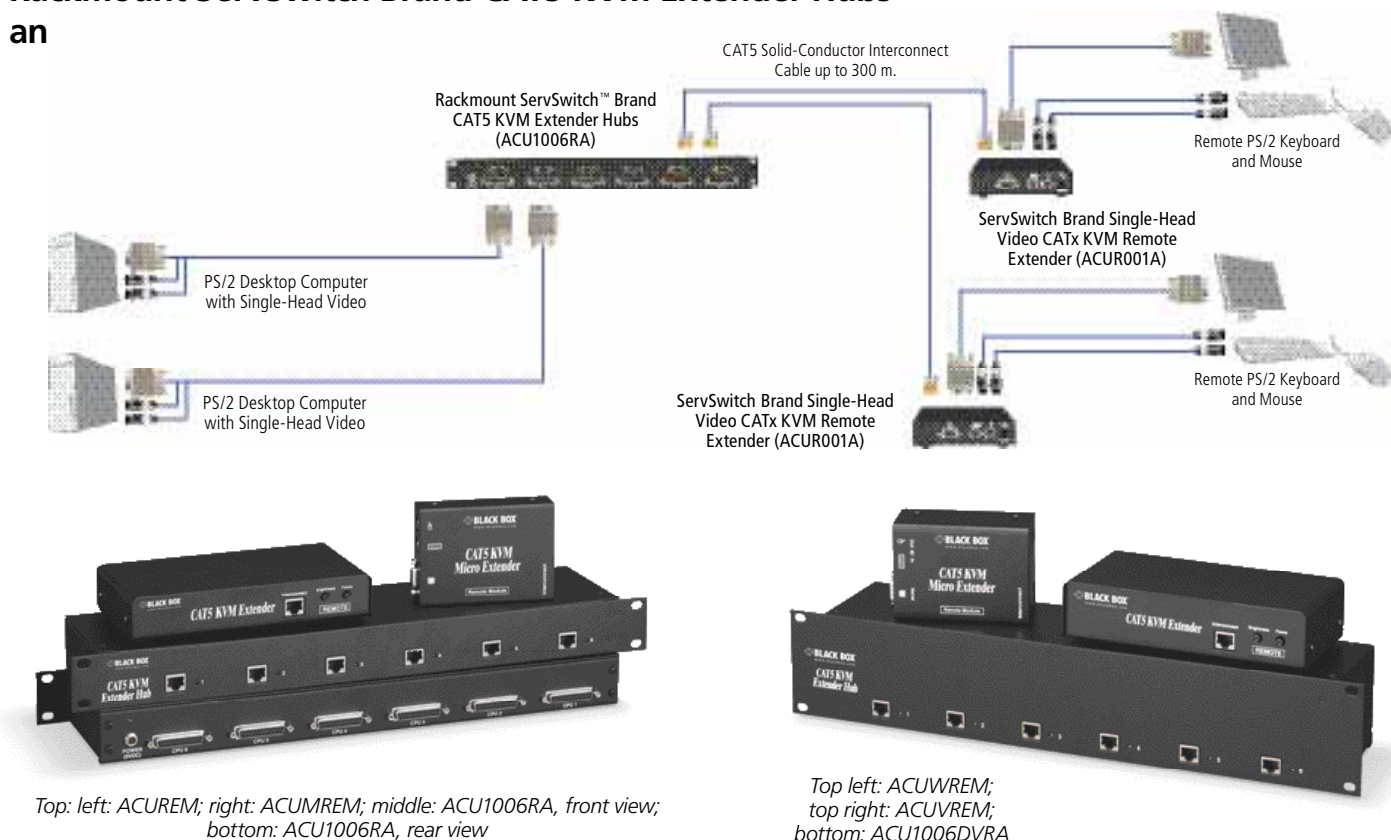
ACU3201A
ACU3209A
ACU3222A
ACU3228A

For full features and specs, and pricing, go to www.blackbox.fi.

Extend your KVM signals up to 300 meters *and* add switching, audio, serial devices, and multiple monitors at the far end!



Rackmount ServSwitch Brand CAT5 KVM Extender Hubs



- Send keyboard, monitor, and mouse signals — plus optional serial data — up to 300 meters from a CPU or ServSwitch.
- Or just send KVM signals 45 meters with the compact Micro models (see Buyer's Guide).
- It's like getting 6 or 12 extenders in one rackmountable box!
- With dual-access hubs, you can attach a local KVM or KVM switch to each CPU.
- Bidirectional stereo audio available, too.
- Feature built-in surge protection with a clamping voltage of 15 volts.
- Fully adjustable video equalization for the best possible video quality.
- **Standard Warranty** — 1 Year
- **Extended Warranty** — 1 Year or 3 Years

Our extender hubs combine 6 or 12 local hubs into one rackmount chassis. Just attach your CPUs with our Coax CPU Cable (EHN230, www.blackbox.nl), then connect remote units via already installed CAT5 UTP (EYN840A-1000). Some remote units support CAT5e and CAT6, too.*

The hubs and remote units require no software, are operating system independent, and work with a variety of hardware. The hubs perform complete PS/2 keyboard/mouse emulation for the attached CPUs.

The hubs and remote units also feature built-in surge protection to defend your UTP link side against surges and spikes.

First, choose a hub for your application from the list to the right. Then use the Buyer's Guide on the facing page to order a remote unit for each active hub port. Compatible local extender units (ServSwitch Brand Single-Channel and Single- or Dual-Channel KVM Extenders) can be found online.

The Buyer's Guide shows which remote is compatible with which hubs and which local extenders. If you have questions, please call our FREE Tech Support at **0201 888 800**.

* NOTE: Units that support skew compensation work with CATx cable.

Rackmount ServSwitch Brand CAT5 KVM Extender Hubs

6-Port Standard	ACU1006RA
12-Port Standard	ACU1012RA
6-Port with Serial	ACU1006SRA
6-Port Standard Dual-Access	ACU1006DRA
6-Port Dual-Access with Serial	ACU1006DSRA
6-Port with Serial and Bidirectional Stereo Audio	ACU1006VRA
6-Port Dual-Access with Serial and Bidirectional Stereo Audio	ACU1006DVRA

For full features, specs and pricing details, go to www.blackbox.fi

Buyer's Guide | ServSwitch Brand CAT5 KVM Extender Hub Remote Units

For more product details, go to blackbox.fi

Chassis	Serial Devices	Audio Devices	Distance	Maximum Resolution	Cable	Video Type	Compatibility		
							Hubs	Local Extender Units	Product Code
Full	—	—	300 m	1600 x 1280 @ 60 m, 1280 x 1024 @ 90 m, 1024 x 768 @ 300 m	CAT5	Single-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU1001A, ACU1009A	ACUREM
Full	—	—	300 m	1600 x 1280 @ 60 m, 1280 x 1024 @ 90 m, 1024 x 768 @ 300 m	CAT5	Single-head	ACU1006RA, ACU1012RA	ACU1001A	ACUREMSW
Micro	—	—	45 m	1280 x 1024 @ 45.7 m	CAT5	Single-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU1001A, ACU1009A, ACU3001A, ACU3009A	ACUMREM
Micro Hub	—	—	45 m	1280 x 1024 @ 45.7 m	CAT5	Single-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU1001A, ACU1009A, ACU3001A, ACU3009A	ACU1006MRA (6) Micro Units (ACUMREM), rackmounted
Full	•	—	300 m	1600 x 1280 @ 60 m, 1280 x 1024 @ 90 m, 1024 x 768 @ 300 m	CAT5	Single-head	ACU1006SRA, ACU1006DSRA	ACU1002A	ACUSREM
Full	•	•	300 m	1600 x 1280 @ 60 m, 1280 x 1024 @ 90 m, 1024 x 768 @ 300 m	CAT5	Single-head	ACU1006VRA, ACU1006DVRA	ACU1022A, ACU1028A	ACUVREM
Micro	•	•	45 m	1280 x 1024 @ 45.7 m	CAT5	Single-head	ACU1006VRA	ACU1022A, ACU1028A, ACU3022A	ACUWREM
Micro Hub	•	•	45 m	1280 x 1024 @ 45.7 m	CAT5	Single-head	ACU1006VRA, ACU1006DVRA	ACU1022A, ACU1028A, ACU3022A	ACU1006MRVA (6) Serial and Stereo Units (ACUWREM), rackmounted
Micro	—	—	45 m	1280 x 1024 @ 45.7 m	CAT5	Dual-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU3201A, ACU3209A	ACUMR02A
Micro	•	•	45 m	1280 x 1024 @ 45.7 m	CAT5	Dual-head	ACU1006RA, ACU1006DRA	ACU3222A, ACU3228A	ACUMRA02A
Micro Hub	—	—	45 m	1280 x 1024 @ 45.7 m	CAT5	Dual-head	ACU1006VRA	ACU1028A, ACU1022A, ACU3022A	ACU1006MRVA
Full	—	—	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Single-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU1001A, ACU1009A, ACU3001A, ACU3009A, ACU1049A, ACU2001A, ACU2009A	ACUR001A
Full	•	•	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Single-head	ACU1006VRA, ACU1006DVRA	ACU1022A, ACU1028A, ACU3022A, ACU2022A, ACU2028A	ACURA001A
Full	—	—	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Dual-head	ACU1006RA, ACU1006DRA, ACU1012DRA	ACU2201A, ACU2201A-R2, ACU3201A, ACU3029A	ACUR002A
Full	•	•	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Dual-head	ACU1006VRA, ACU1006DVRA	ACU2222A, ACU2222A-R2, ACU3222A, ACU3228A	ACURA002A
Full	—	—	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Quad-head	ACU1006RA, ACU1006DRA, ACU1012RA	ACU1001A, ACU1009A, ACU3001A, ACU3009A, ACU1049A, ACU2001A, ACU2009A	ACUR004A
Full	•	•	300 m	1600 x 1200 @ 200 m, 1280 x 1024 @ 300 m	CATx	Quad-head	ACU1006VRA, ACU1006DVRA	ACU1022A, ACU1028A, ACU3022A, ACU2022A, ACU2028A	ACURA004A

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